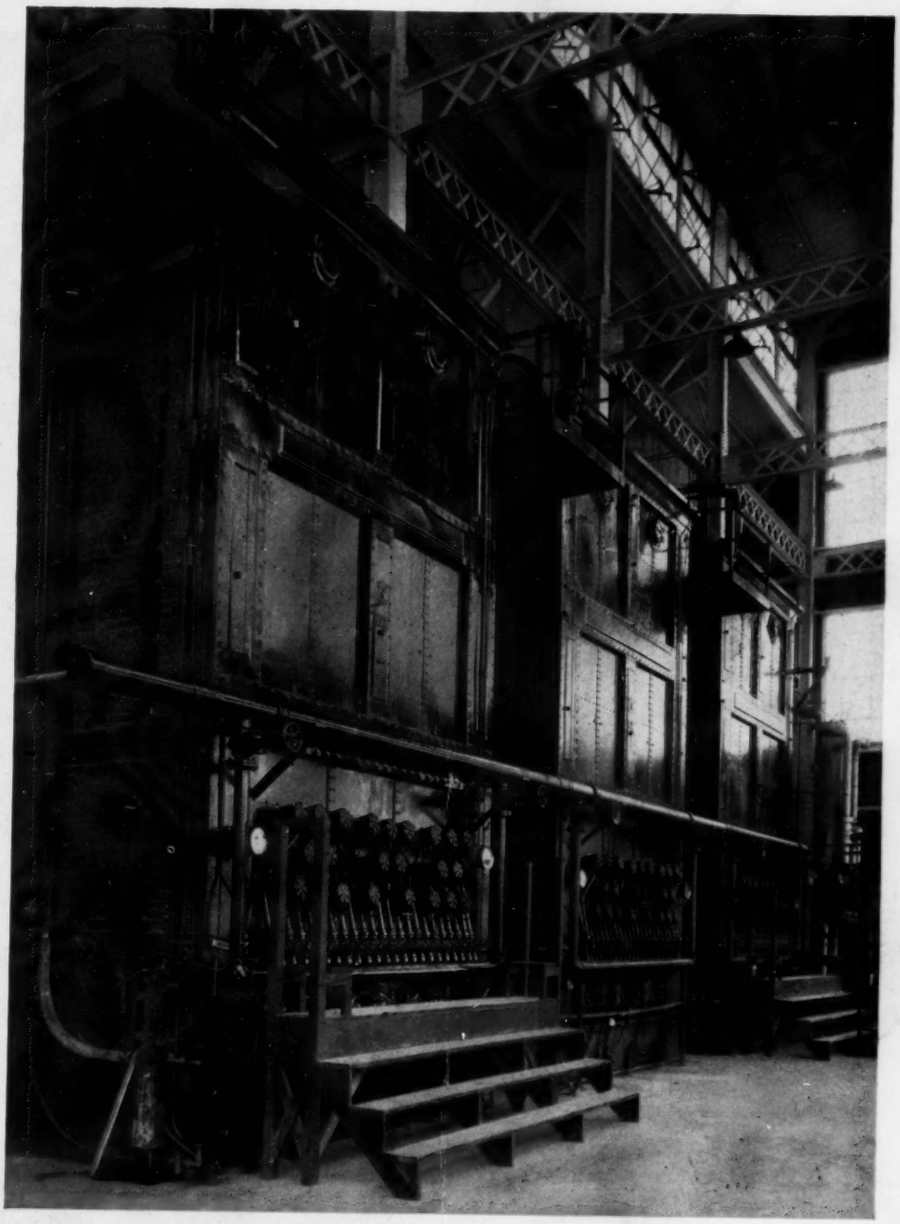
WESTERN GAS

July
1926



These three 600 H.P. boilers on the lines of the Southern California Gas Co. carry a 200% overload. They are installed in the Los Angeles plant of the Goodyear Tire and Rubber Co.

20 Cents
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A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

ANNOUNCEMENT

The rapid increase in the sales of the Merco Nordstrom lubricated plug valves evidences a growing conviction that the oldest known type of valve, namely, a plug cock, is also the best if a proper film of lubricant is maintained between the seating surfaces of the plug and body.

Patents suggesting lubricated plug cocks have appeared from time to time during the past twenty-five years or more, but none of these suggstions was successful, because none of them embodied means for separating and sealing the seating surfaces of high pressure lubrication.

Nordstrom was the first to discover and apply the principle upon which the successful lubrication of plug cocks depends; his fundamental patent (U. S. Reissue No. 14,516) relates to two distinct improvements in plug valves, namely:

1st. Means for introducing lubricant under high pressure in such a way as to separate the bearing surfaces and distribute lubricant evenly over them.

2nd. Means for resiliently holding the plug in a position slightly separated from its seat so that an appreciably thick film of lubricant can be maintained between them at all times.

The second construction is suitable chiefly for comparatively low pressure work, such as gas distribution. But the first improvement—that is, the separation and sealing of the seating surfaces by forcing lubricant between them—is applicable to all types of service.

We hold that any plug valve in which the seating surfaces may be separated or sealed by high pressure lubrication is an appropriation of Nordstrom's invention and infringes this patent, and we know of no other means of introducing and maintaining a proper film of lubricant between the seating surfaces. The wide and increasing use of the Merco Nordstrom lubricated plug valve renders necessary the above statement in order that the users of these valves and other manufacturers may clearly understand our position.

MERCO NORDSTROM VALVE COMPANY

SUBSIDIARY OF THE MERRILL COMPANY

Engineers— *Manufacturers*

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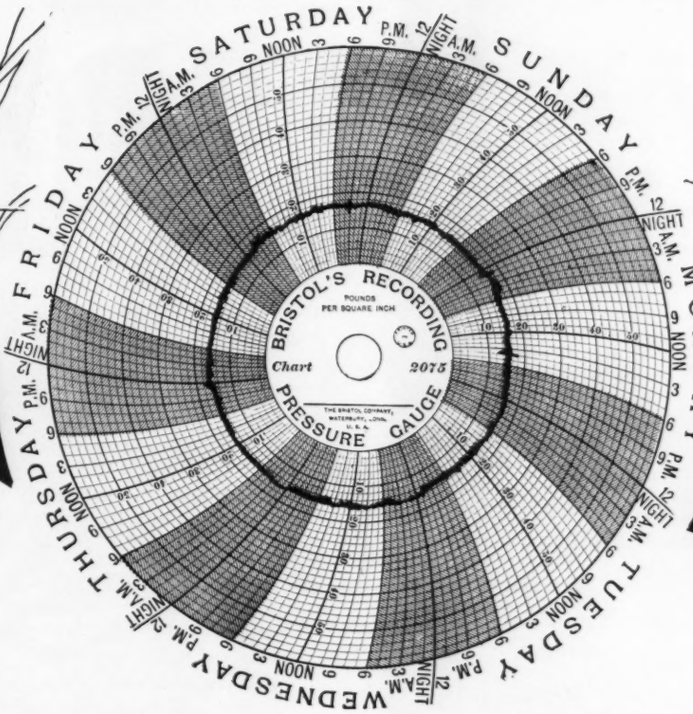
Merco Nordstrom
PLUG VALVES

YOU CAN RELY ON RELIANCE

For industrial service



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This chart tells the story of RELIANCE performance

THIS chart, forwarded to us by one of Southern California's largest gas companies, is *evidence* of the type of performance Reliance Regulators render. To quote from their letter, "The average load on this regulator was 3500 M per hour, the inlet pressure being 90 to 125 pounds and the average outlet, as you will observe by the chart, is 16 pounds. We have *never* seen a better chart from any type or make of regulator and we want to congratulate you upon its excellent performance." ¶ Thus, day in and day out, Reliance Regulators are establishing *new* and *higher* standards of regulator performance.

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Official Publication Of The
Pacific Coast Gas Association

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in large steam plant

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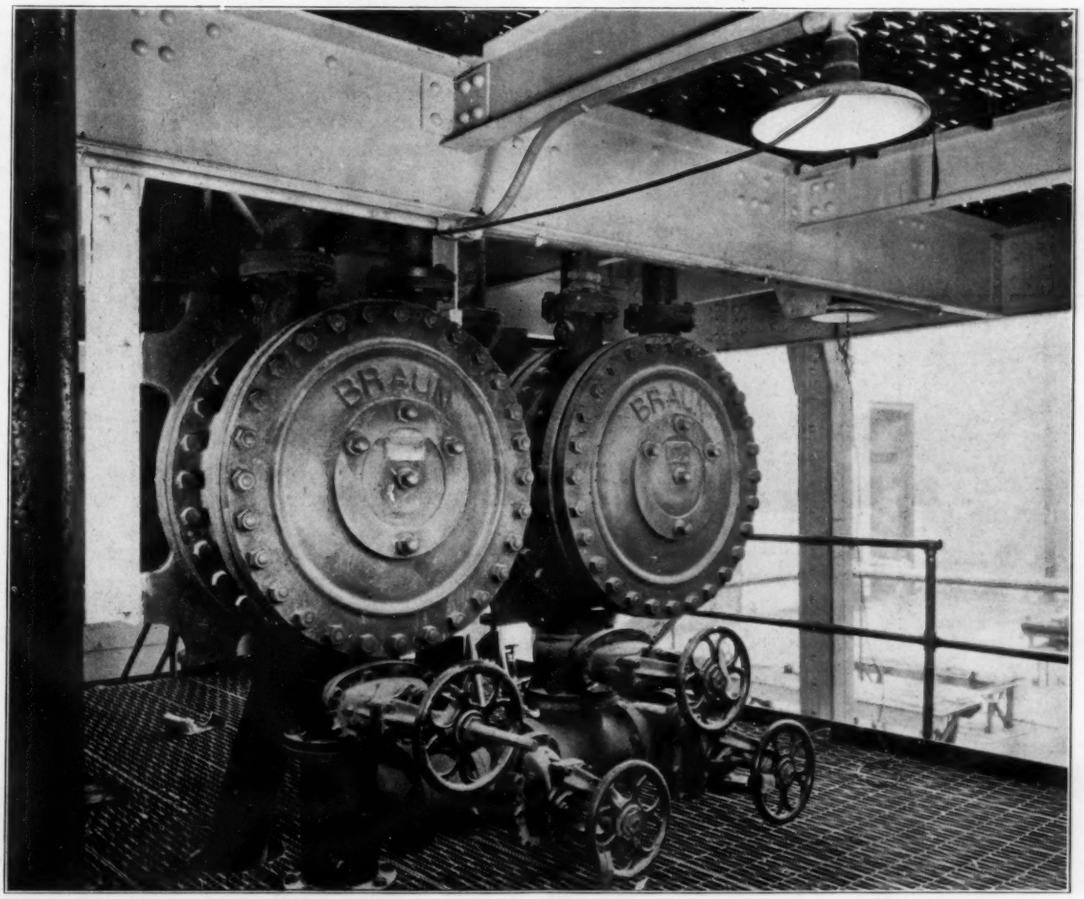
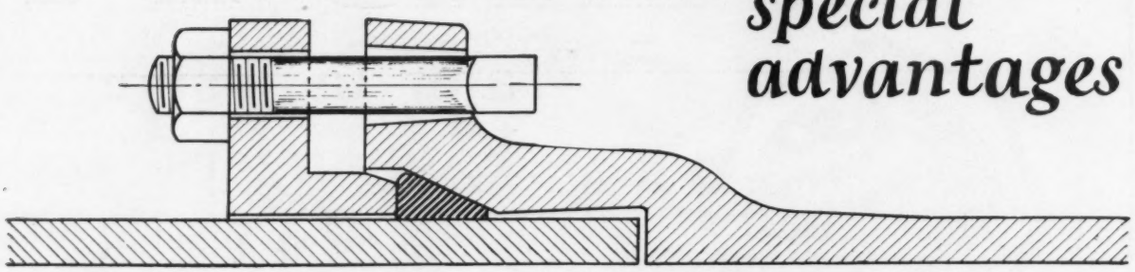
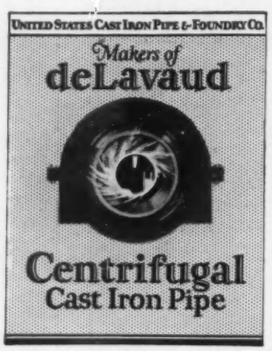


The Anthony High Pressure Joint *and its special advantages*



1. *Requires one-half the usual number of gaskets.*
2. *Invariable Diameter—outside surface smooth —offering a perfect seat for the gasket.*
3. *Malleable iron bolts resist corrosion and eliminate self-electrolysis due to use of dissimilar metals.*
4. *Cast iron follower ring remains rigid and if for any reason gasket has to be removed the ring can be driven back without bending.*
5. *Changes and connections may be easily made using plain end pipe and an all cast iron coupling.*



High pressure gas distribution is now accepted as good engineering practice and offers a material saving over a low pressure system. deLavaud centrifugal pipe equipped with the Anthony Joint gives a line of unusual flexibility, tight under the maximum pressures used in distribution.

Equipped with a lead or duck-tipped gasket these joints may be employed for either manufactured or natural gas.

If desired, deLavaud centrifugal pipe can be shipped in 24 foot lengths with a welded joint in the middle. Such an installation as this requires only 220 gaskets to the mile—one quarter of the usual number.

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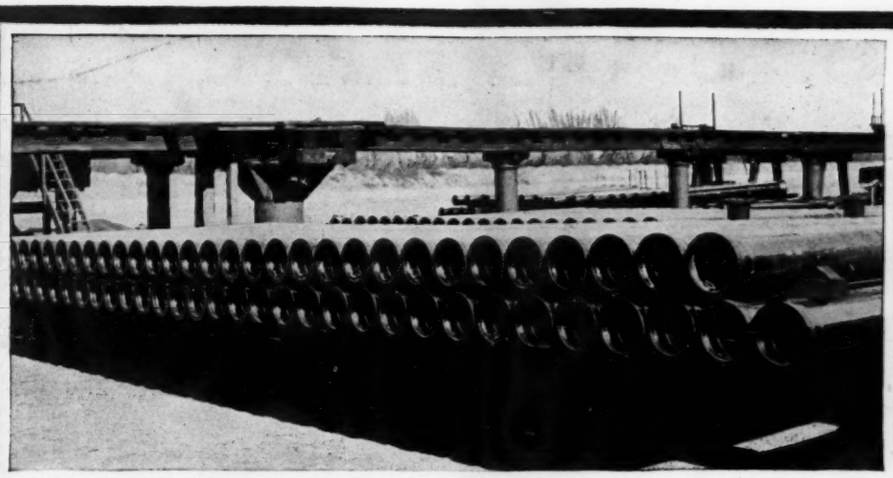

deLavaud Centrifugal Cast Iron Pipe

—is now ready to ship in sizes from 4″ to 20″

The principal features of deLavaud Centrifugal Pipe are:

1—Lower cost per foot.

2—Greater carrying capacity due to larger inside diameter. Its smooth surface produces less friction.

3—An even greater resistance to corrosion owing to its finer granular structure.

4—Cheaper to install owing to its uniform lead space and self centering bell.

5—It is easier to cut and tap.

6—Its greater strength and uniform section makes it valuable for use for higher pressures.

7—Adaptability to special joints due to its smooth exterior and uniform circumference.

8—It is made to be used with standard fittings and specials.

9—Annealing gives a uniform metal with no casting strains.

10—This method of casting leaves no possibility for sand holes or gas pockets.

Write for special literature covering manufacturing conditions and specifications of deLavaud Centrifugal Pipe.

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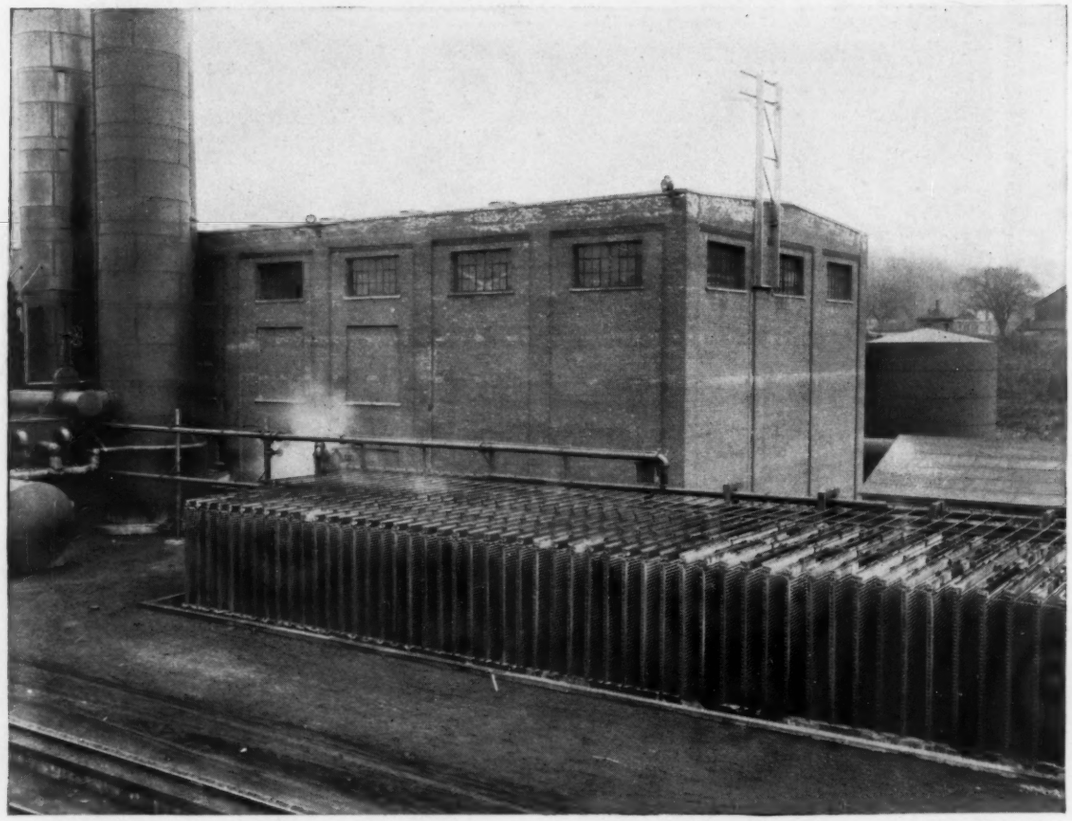
Steere Cooling Coils

Sherardized, Black or Admiralty Tubes



Patents Applied For

Thermally—more efficient than pipe coils can be made.

Structurally—many advantages that cannot be obtained with any other type of coil. No threads—completely shop erected—no expensive field work.

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Cost—These coils are now made in such quantities that we can sell them at a lower price than any other well built coil on the market.

The Best at the Least Cost

We have our own Sherardizing Plant—operating under an exclusive license from the General Electric Company.

We Know We Can Save You Money

STEERE
ENGINEERING CO.
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Convenient Appliances to Have on Hand

THE S. G. M. S. "U" gauge illustrated is of the portable type. It is just the thing for your Distribution and Complaint men. It is also handy to have around the plant

The glass tubes of the gauge are firmly seated into the rubber "U" connection piece. These tubes are guarded at the top of the boxwood scale by a twin rubber fitting. This eliminates the liability of breakage to a great extent.

GAS MAIN TAPE

Another convenient appliance to have is gas main tape for temporary repairs. Our tape is a high grade soap tape, 8 inches wide and put up in air-tight containers. This will keep in condition for a long time. We also make a binding tape to be used over the soap tape. Repairs made with these tapes will hold for long periods if necessary.

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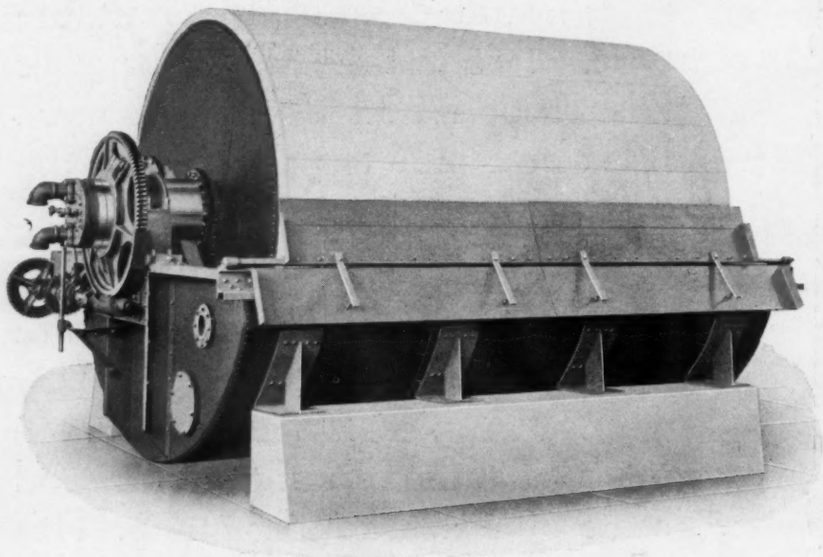
The Central Arizona Gas Company reduced space required 70% and operation costs 42% by using thickeners and an OLIVER filter. Installation handled by one man and the whole plant kept clean.



Oliver-Borden Thickeners

and

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furnish the ideal method of dewatering Lampblack to furnaces or briquetting presses in the required condition without handling.

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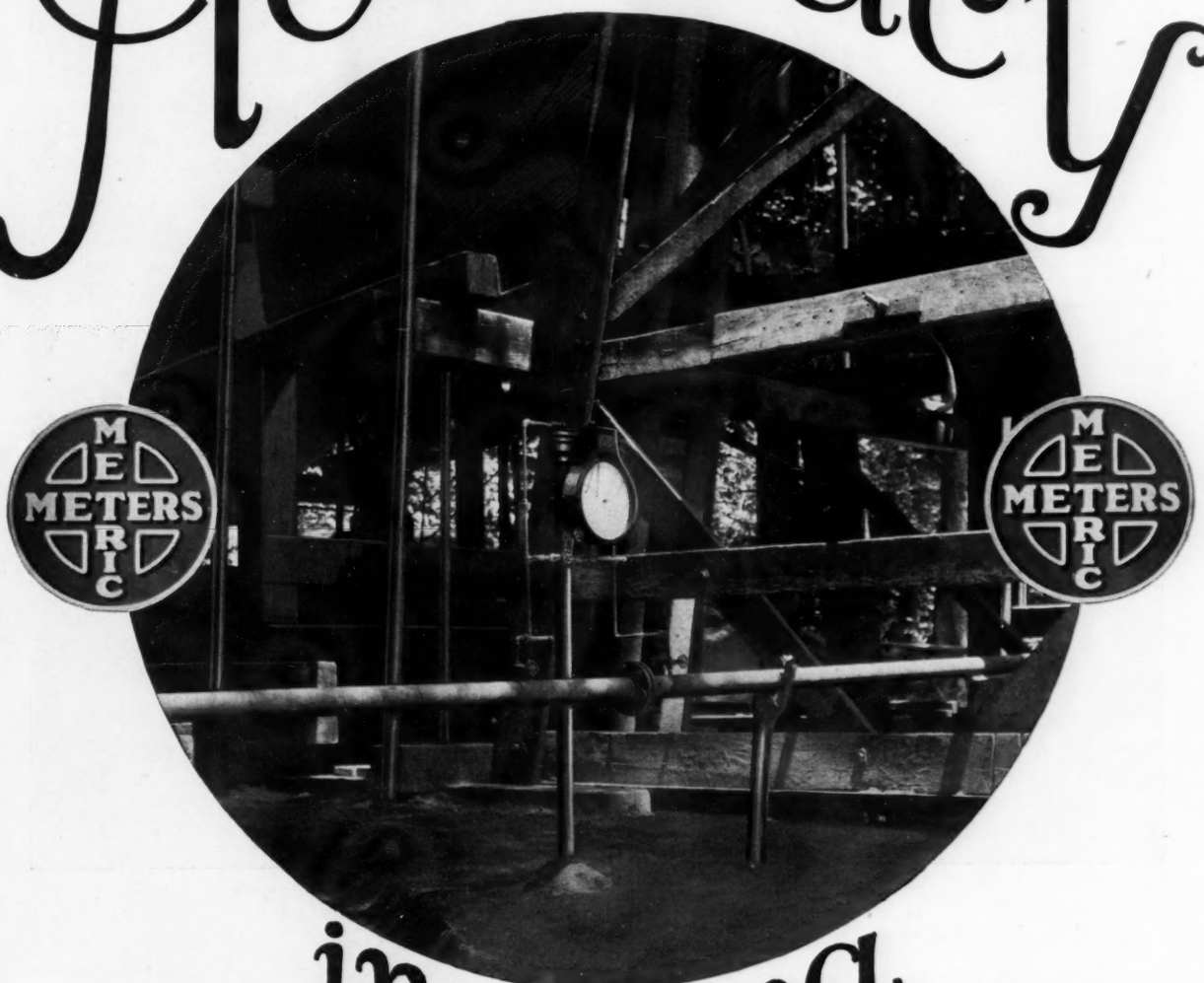
Accuracy



in Java

Westcott & Greis, Inc.
Sales Service
Dallas TULSA Los Angeles

The illustration is of a gas well in Java owned by one of the Royal Dutch Shell Companies.

In distant Java or in California, wherever there is accurate measurement of oil, gas, steam or water, these meters are in service. Thir superior construction results directly in records which are accurate.

METRIC orifice METERS

They are designed in enough types to offer a complete service that covers every kind of measuring job. They are built to give the utmost dependability in operation with a minimum of attention and expense in maintenance and a maximum period of service.

METRIC METAL WORKS

of the American Meter Company-Inc.

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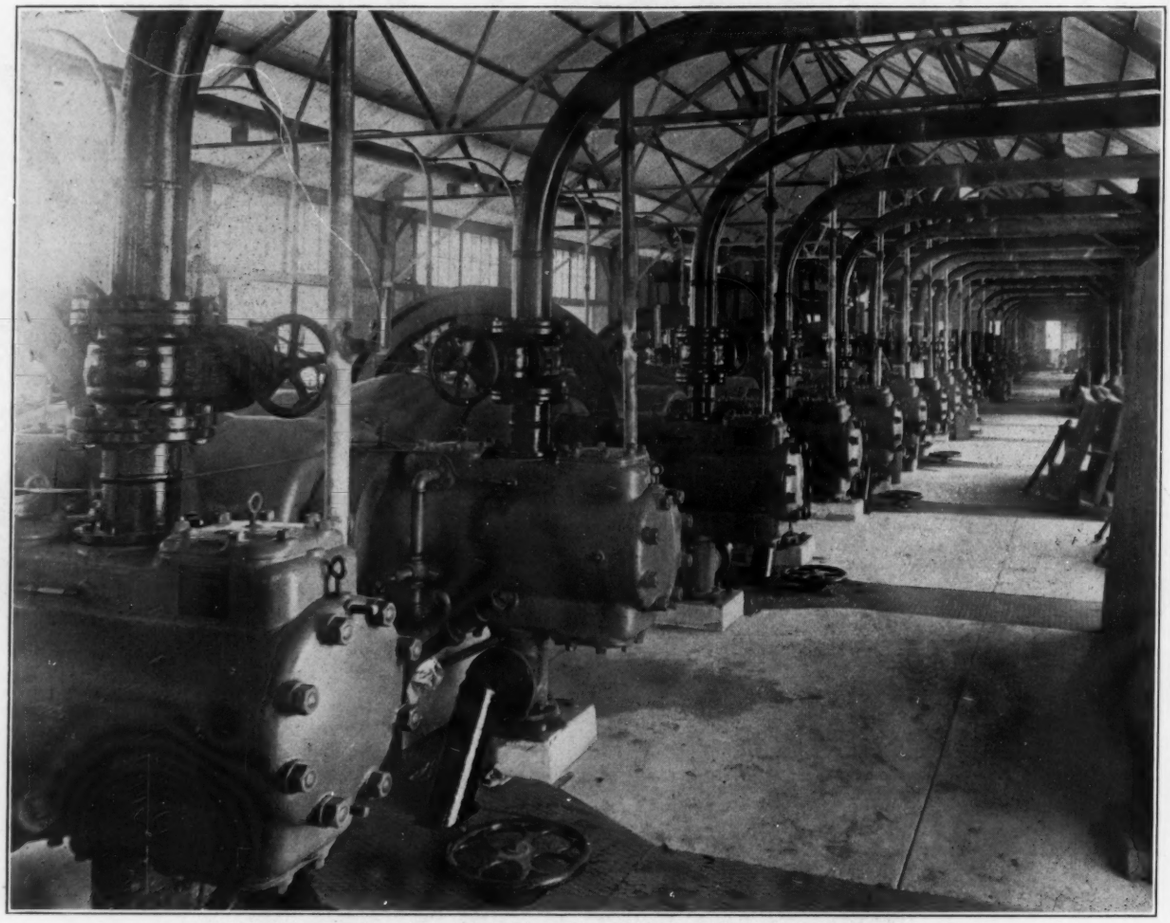
CLARKS



Production

In the last analysis isn't Production the one important point to consider when purchasing Compressors?

Such things as service, fair dealing, replacement of defective parts, etc., are considered essential by every reputable builder so that purchaser no longer questions these points.

What they are most interested in is "how much will the Compressor earn for me?" CLARKS have been standardized so long that their steady operation is assured.

Buy a Reliable Compressor that is Proven

Compressors
60 to 200 H. P.

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CONSTRUCTION
ELECTRIC
GAS COMPRESSION
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METAL WORKING
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60 to 125 H. P.

Count on this machine to bring down your costs

Costs count—and drilling machines that waste time and effort instead of conserving them are expensive, cost-increasing equipment. Use Mueller Drilling Machines—to save both time and money.

The man on the job appreciates the sturdy quality of Mueller Machines. Well built and accurate in operation, they enable him to do a workmanlike job—quickly. They stand rough usage, too; are built to stay on the job and give dependable service without repair delays.

Use Mueller Drilling Machine "E" for large drillings on all kinds of pipe of all sizes. It will drill ¼" to 1-inch holes under pressure. Mueller Service Clamps with patented lead ring gasket, used with this machine, insure leak-proof connections.

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Every connection is a **Vital Spot** in gas distribution. Safeguard these **Vital Spots** with brass goods of known quality and dependability. Specify Mueller 69-year-tested stops.

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(Established 1857)

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Canadian Factory: MUELLER, Limited, Sarnia.

276

MUELLER

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Before the invention of the gas meter by Samuel Clegg in 1815, the cost of gas was estimated by the number of hours it was consumed through burners of a given size.

An inspector was sent by the gas company to go the rounds of several districts at stipulated hours of the night. His mission was to to see that the lights of the consumer were duly extinguished according to contract.

He announced his visit by loud rapping on the sidewalk, at which time the consumer would resort to candles or oil lamps. If the gas lights were not immediately turned off, he would pound on the door and shout—

"Nine O'Clock—Lights Out!"

If then the lights were not extinguished he would close the tap attached to the service pipe on the street, promptly shutting off the gas.

It may be readily understood that the contract system produced continuous complaints and disagreements between the gas companies and their consumers. Honest consumers who lived up to their contracts paid as much for their gas service as did the unscrupulous consumers who burned their lights after the inspector had made his rounds.

Under such conditions gas companies could not exist and many of the earlier utilities in both England and America failed. The introduction of a method of accurate measurement by automatic and inexpensive means became imperative.

Accordingly the leading gas engineers of the day set about to develop such a method of gas measurement.

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of the
American Meter Company, Inc.
Northwestern Representative

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Northwestern Gas and Electric Equipment Co.

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AMERICAN METER COMPANY · MEASUREMENT ENGINEERS ·

Why We Did Not Reduce Prices?

SIX months ago we were faced with a suggestion to lower prices still further. A steadily increasing sales volume, greaer purchasing power and still better production tools and methods would have made an additional reduction possible. A careful study of the situation revealed that engine buyers had always recognized a higher quality in Cooper engines and in a majority of cases had been willing to pay extra for a better engine. We were convinced that what the trade wants is still better gas engines at reasonable prices—not necessarily cheaper engines.

Instead of reducing prices we more than added the savings, due to manufacturing methods, to the materials in the engines. Today the materials in a Cooper 170 H. P. engine are costing several hundred dollars more than they did a year ago. Alloy steels, more drop forgings and semi-steel to replace cast iron are being used to make still better engines. A Cooper engine now represents a better value than ever before during the 93 years we have been building power machinery.

THE C. & G. COOPER COMPANY

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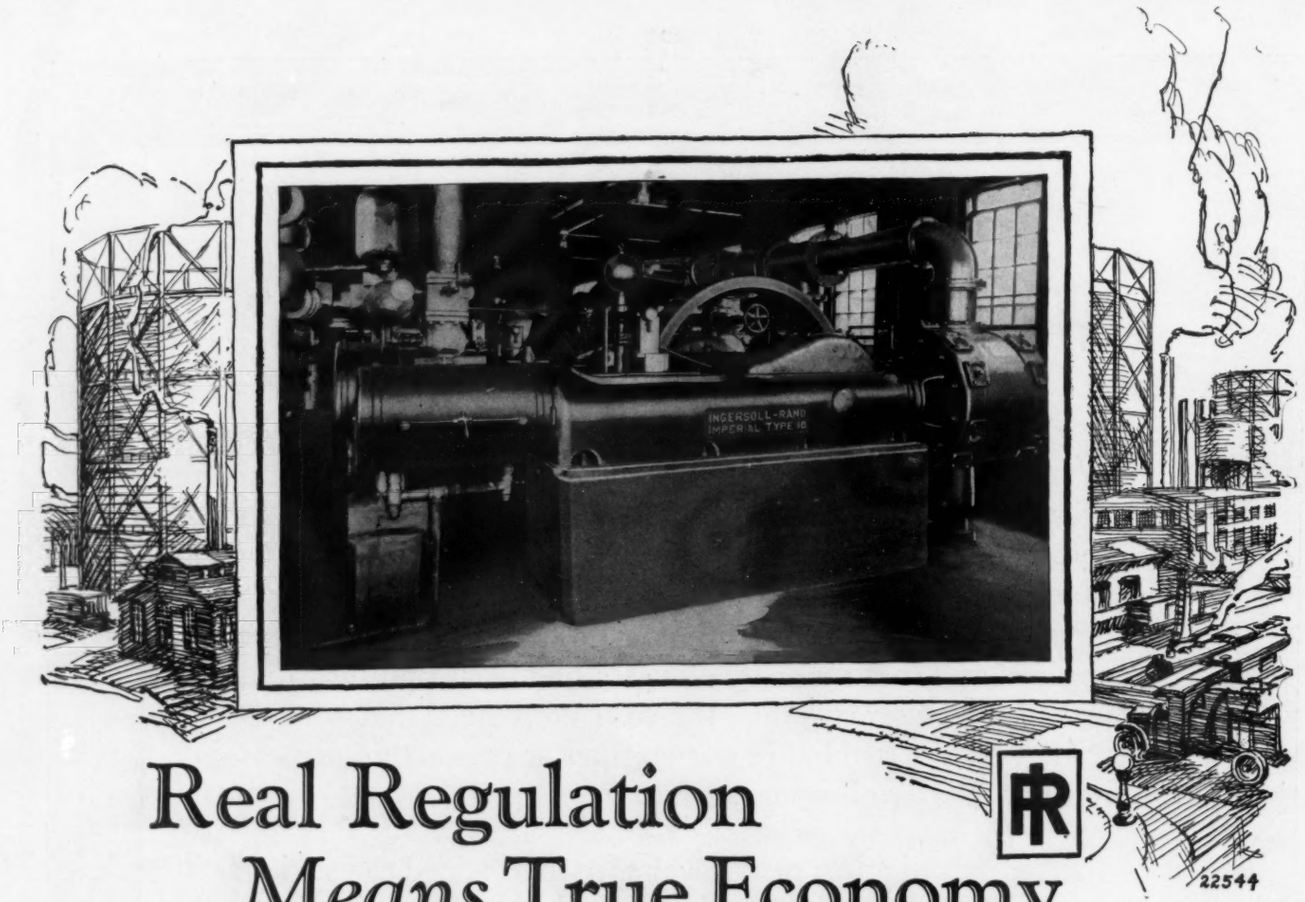
HOME OFFICE, MT. VERNON, OHIO

Dallas, Texas **Tulsa, Okla.**



Real Regulation *Means* True Economy

Regardless of the change in your hourly load, the pressure in your distributing mains can be kept constant if you use an XPV Compressor equipped with an automatic cut-off pressure-type governor. The chart from your recording pressure gauge will then be a perfect circle, while your load chart will be a series of peaks and valleys. Such perfect regulation means economy of the highest degree.

Type XPV Compressors can be furnished as single-stage units for low pressure, or with two-stage cylinders and an intercooler for higher pressures. The gas cylinders have Ingersoll-Rand plate valves. The steam cylinders have balanced piston valves, which are particularly suitable for high steam pressures and superheats and are equally satisfactory for other steam conditions.

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Ingersoll-Rand

WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in the *Eleven Western States*

Public Relations
UNDER *PUBLIC REGULATION*

By LESTER S. READY

Chief Engineer, Railroad Commission of the State of California

MUCH progress in the development of good public relations, on the part of utilities has been made. In many places the utilities have made a business of improving public confidence and public good will. The public has been informed and has gained a better appreciation of the utilities. The utility men have gained a better appreciation of the desires, wants and rights of consumers and the public in general. Much progress has been made, but the opportunities and responsibilities for advancement in this field are still great. It is no time to be self-satisfied. In some quarters a full appreciation of the value to the utilities of better relations are thoroughly understood. On the other hand, one is surprised, at times, to see the lack of sincere and honest application of the principles involved; half truths are put out, misinformation presented to the public and to the commissions, sharp practices indulged in, with the result that a distrust on the part of the utility consumers continues.

Many Public Contacts

The public utilities are probably the most extensive retail credit enterprises that we have. . . . The service is rendered on a monthly credit basis. . . . The service rendered is a necessity. The dealings are primarily with individuals. The use of the public streets brings the utilities in direct contact with those elected to represent the public politically. On every side, and in practically every phase of its activities the public utility comes in direct contact with the public, individually, in groups, and politically. It is, therefore, axiomatic that the utility must obtain and retain the public confidence and goodwill.

MANY gas executives will read this synopsis of Mr. Ready's address to the public relations section of the Pacific Coast Electrical Association and nod their heads in approval. A few will take issue with his opinions. The columns of this journal are open to other discussions of the public relations situation, the importance of which is widely admitted.

Lester S. Ready

The public utility is, of necessity, not a temporary enterprise. Every dollar of annual gross revenue received requires a capital investment of from $4.00 to $5.00. Rates are not made to amortize the investment; the public necessity demands a service continuing into the future. Once in the business, there is no way out for the business. The owners may get out by sale or be forced out by condemnation. The obligation to expand demands the continual addition of capital. The success of the utility, therefore, depends upon the continuing profits that it may make in rendering the service that it supplies. Lasting public goodwill will aid the obtaining of continuing return.

A Utility's Obligations

The monopolistic nature of the public utility demands a higher standard of courteous service and it calls for greater public goodwill than the competitive enterprise. As part of the public, we can stand some incivilities on the part of a storekeeper if we can trade somewhere else should we desire, but we balk at the same treatment when that option is taken away. *"To have to"* goes against our American makeup. Because the utility is primarily a monopoly, it has to contend with the suspicion that exists in most of us that excess profits go with monopolies. For these reasons a high standard of service, a high standard of ethics and a high standard of treatment under the conditions of privately-owned monopoly is required.

Good public relations are essential to publicly regulated utilities. . . . Good public relations represent the goodwill value of the utilities; continuing return is assured and more prompt relief is obtained when rates must be increased and complaints for reduction of rates do not occur or are delayed. . . . No company is acting in good faith to its technical and operating men that does not gain and retain the good will of its customers.

Good Relations Smooth the Way

There are certain utilities today operating at less than what might be classified as a fair return who, I believe, could materially reduce their expenses—certainly their legal expenses—and materially improve their earnings if they would but be more considerate and more courteous. Good public relations hasten and make more easy the doing of justice when increase in rates is necessary, and postpone complaints and even eliminate them. Bad public relations and poor

service are more often a cause of rate complaints and rate reductions and the holding of companies to a limited return than are excessive rates.

The results of bad public relations, lack of confidence on the part of the public, though generally not as immediate in their effect upon the utility, are in the ultimate as serious as in a competitive enterprise. The fact that the detrimental results are often postponed tends to lull many into a lack of realization that they exist. The inability of the consumer to cease taking service when ill treated prevents the effect showing on the balance sheet of the company at once; yet the resentment of ill treatment develops and grows. It shows as a vigorous protest to any increase in rates, when such is found necessary, and it fosters and makes converts to public ownership.

The public confidence and goodwill essential to public utilities must be based on the strictest honesty, upon courtesy, including sincerity and consistency. High pressure salesmanship fails in public utility service because it is not lasting. . . .

THE sale of stock to customers has had a most beneficial effect, both in making the customer interested in the company and in bringing home to the utility men the necessity of consistency. . . . The customer ownership of stock has had as much of a beneficial effect on the utilities as it has had on the customers. . . .

Some utility men have had the idea that under regulation nothing could be gained by efficiency or by better public relations; that the results of efficiency were or would be taken away from the companies and that goodwill was less important than legal rights. This has been a most unfortunate attitude; and it has been detrimental to good public relations. The problem of rewards for efficiency has been one seriously considered by regulatory men. Normal improvements in efficiency and development in the art are expected under the normal fair return. Failure to keep up with progress of developments will ultimately result in reduced returns. It is becoming realized that public regulation cannot assure a continuing return even with efficiency of operation, nor can it grant rewards for special and outstanding efficiency to a company which does not have the confidence of the public it serves. When you believe you are entitled to reward for efficiency, be certain that the public relations department of your company has been as efficient and effective as you believe your construction and operating departments have been and that your company has the goodwill of the public it serves.

INTER-COMPANY cut-throat competition of the pre-regulatory type is not conducive to good public relations under regulation. Back yard fights over business, comparable with moonshine jags, do not improve a utility's reputation for non-discrimination nor help the public's acceptance of regulated monopolies. Such practices are amusing though most unfortunate. . . .

The problem of maintaining good public relations increases with the size of the utility. . . . Centralization of authority results in centralization of responsibility and encourages and fosters, in the parlance of the street, "passing the buck" by the local representative. Every local district should be a unit in itself, at least so far as the public is concerned. It must be the company to the people and be an integral part of the local community.

There has been too great a tendency on the part of many utilities to make an alibi of the Railroad Commission. Too often, when it is not desired to do certain things, the consumer is advised: "The Railroad Commission will not let us." The Railroad Commission will take the responsibility for its acts of regulation. Be sure you take your responsibility for your acts of management. "Passing the Buck" to the Commission may ease the way temporarily, but it detracts from the ultimate lasting public confidence necessary to a public utility.

If a utility wants justice done promptly and continuously, public goodwill and confidence is a great aid in obtaining same. . . . Putting the soft pedal on applications for rate increases, failure to make a definite request, failure to inform the public, have been detrimental to public relations. Surprises in the form of rate increases are unpleasant to the individual consumer. A resentment arises because it is felt that something was "put over." This condition breeds suspicion of the utility and of the regulating commission and stirs up resentment against the public utility and regulation. . . .

Regulation has its own public relation problem to contend with. It is doubtful whether it can indefinitely continue unless public confidence is retained. The doing of a duty, often in opposition to the public sentiment and apparent public desire, is unpopular, and regulation has had its share of unpopularity, but the success of regulation in California to date—and I am certain it has succeeded to as great an extent if not more than in any other state in the Union—has mainly been on account of the continuing ideal of justice and honesty which has guided the members of the Commission and has been the foundation of its acts. It has sincerely and conscientiously searched for the facts and endeavored to do justice.

IF you believe in the principles of effective regulation and you desire to see it retained, you can aid greatly by creating better public relations between yourself and your customers. What breaks down confidence in public utilities will have its effect on confidence in regulation. And what breaks down confidence in regulation under the present scheme of things will break down the confidence in utilities. Continuing sound regulation must be based on confidence. Bad public relations between the utility and its consumers create distrust, make unpopular decisions required by the limits of law or for the continuation of service and result in criticism of regulation and loss of confidence. If you believe in sound public regulation, you will exert every effort to create and maintain the confidence of your customers in you and in regulation. If you are not a believer in sound public utility regulation, but are guided only by the selfish interests of business, you cannot, under the present scheme of things, afford to create a lack of public confidence in either yourself or regulation.

SOME of the highlights of Mr. Ready's opinions on public relations and public regulation, contained in the address which appears on these pages:

"Much progress in the development of good public relations has been made . . . (but) it is no time to be self-satisfied."

"Good public relations represent the goodwill value of the utilities."

"Customer ownership of stock has had as much of a beneficial effect on the utilities as it has had on the customers."

"When you believe you are entitled to reward for efficiency, be sure that the public relations department of your company has been as efficient and effective as you believe your operating and construction departments have been, and that your company has the good will of the public it serves."

"Every local district should be a unit in itself, at least so far as the public is concerned. It must be the company to the people and be an integral part of the community."

"The Railroad Commission will take the responsibility for its acts of regulation. Be sure you take your responsibility for your acts of management."

Lower view: Long sections of pipe being pulled together by use of tractor, during construction of natural gas line to Cheyenne from northern Colorado. View at right: at lunch on the job.

Historic Cheyenne Turns *to* Use *of* Natural Gas Fuel

By ROBERT H. TAYLOR
Colorado-Wyoming Gas Company

¶ The Rocky Mountain region is rapidly developing its natural gas resources, and as a result communities throughout that section are taking advantage of the opportunity to change over from other fuels. Our issue of April reported the introduction of natural gas into Fort Collins, Colorado.

CHEYENNE, Wyoming, one of the oldest cities in the Rocky Mountain Region, famous for its Frontier Day Celebrations, is the latest addition to the natural gas family.

The supply of natural for Cheyenne is taken from the Wellington Field, in the northern part of Colorado, the same field that has supplied the City of Fort Collins, Colorado, for the past seven months.

The 27-mile line from the field to Cheyenne was built by the Colorado-Wyoming Gas Company, a Henry L. Doherty subsidiary, the contracting firm of Wylie and Gates of Casper, Wyoming, doing the work. Forty-foot lengths of extra heavy 6-inch pipe were used, assembled in units of five lengths by the head welding crew. These 200-feet lengths were then tied into the line by a follow-up crew, the line pushed into the trench, painted, tested and the trench back-filled. The trench was cut with a Parsons trencher, deep enough to put the pipe two and one-half feet below the surface. In the 27 miles of line, four streams and five railroads were crossed and in addition many dry arroyos, which spring and summer rains fill to the brim. The work of constructing the line was started about May first and was completed during the second week in June. It is expected that natural gas will be turned into the city mains early in July.

Starting in April, a crew of fitters specially trained for demand meter installation began the work of putting in the Empire style C demand meters. This installation work will be completed by the time natural gas is turned on. The same crew will then cover the town, putting in operation the regulating portion of the demand meters, and adjusting the customers' appliances.

In anticipation of the adoption of natural gas, John G. Keegan, District Manager of the Cheyenne Light, Fuel and Power Company, worked with the city authorities and succeeded in bringing about the adoption of a three part rate. This rate, which will automatically become effective when natural gas is turned on, has a reservation charge of 32 cents per year for each cubic foot per hour reservation and a customer charge of $9.00 per year, both payable in 12 equal monthly installments, and a commodity charge of 45 cents per thousand cubic feet of gas metered.

The company has carried on a well arranged program of publicity intended to familiarize all customers with the use of the new fuel and the rate under which it will be sold. Committees from the various civic organizations have visited Fort Collins, Colorado, where natural gas is now being served on a three part rate, practically identical with the one to be used in Cheyenne, and after studying the conditions existing there have made a very favorable report. Such cooperation between company and consumer, especially in light of the interest about natural gas manifested by the citizens of Cheyenne, will allow the change to be made without confusion and the temporary inconvenience during the change will not create any antagonism toward the company.

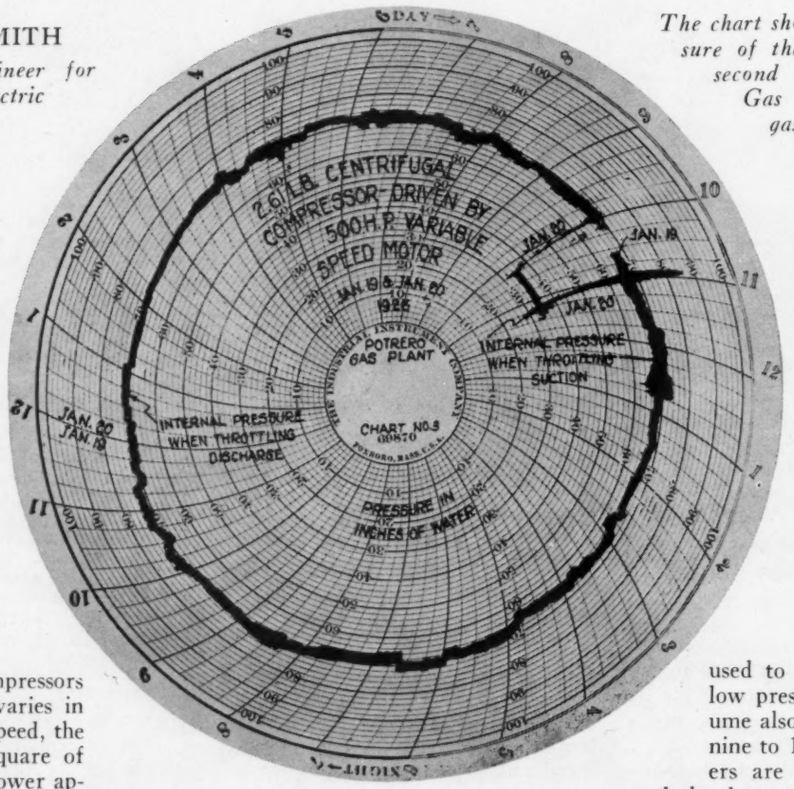
Making ditch for the natural gas line from Wellington fields to Cheyenne.

Variable Speed Induction Motors Bring Economy *on* P. G. & E. Lines

Tests Indicate Superiority *for* Centrifugal Gas *and* Air Booster Use

By HARRY J. SMITH

Gas Construction Engineer for the Pacific Gas & Electric Company, San Francisco.


2-61 L.B. CENTRIFUGAL COMPRESSOR DRIVEN BY 500 H.P. VARIABLE SPEED MOTOR
JAN. 19 & JAN. 20 1926
POTRERO GAS PLANT
INTERNAL PRESSURE WHEN THROTTLING SUCTION
INTERNAL PRESSURE WHEN THROTTLING DISCHARGE
JAN. 20
JAN. 19
CHART NO. 3
PRESSURE IN INCHES OF WATER

The chart shows the internal pressure of the compressor during second test at the Pacific Gas and Electric Co.'s gas plant at the Potrero

THE first installation of a variable speed induction motor, direct connected to a centrifugal compressor was made in the year 1920. When placed in operation it failed to give the desired results. This was due to the fact that a 20 per cent speed reduction was not sufficent to take care of the variations in volume and pressure.

In view of the fact that with centrifugal compressors the volume of delivery varies in direct proportion to the speed, the pressure varies as the square of the speed, and the horsepower approximately as the cube of the speed, it is evident that the wide variation in volume of gas sent out and the pressure required for gas from hour to hour and from season to season must necessarily cause a great variation in the horsepower consumed. This means that the torque actually necessary, in a compressor designed for this purpose, will vary quite widely. It was the lack of appreciation of the wide range in variation that caused a misunderstanding and a failure to realize a possible saving in horsepower.

Advantages of Change-over

Variable speed induction motors are now being installed for the following reasons: First, by adding additional external resistance for speed control a power saving is possible; second, the gas is delivered to the system with practically no increase in temperature; third, the maintenance on the unit is greatly reduced; and fourth, a better operating condition for regulation is possible through the use of a butterfly valve in the inlet to the compressor.

The 24-hr. test at constant speed, on which above internal pressure chart was made, gave a 2450 KW hr. difference favoring variable speed motor.

In the gas industry we are confronted with variable loads, particularly in gas boosting when large volumes at high pressures for semi-high pressure trunk lines are required for peak hour conditions. During the midnight hours very small volumes and low pressures are all that are required to take care of the demand. Thus variable speed is quite desirable for boosters and compressors. Similarly, variable speed induction motors are suitable for centrifugal air blowers for generators, as this service also demands large and small volumes of air, as well as high and low pressures, due to the conditions of the generators.

Twenty Installations In Use

The Pacific Gas and Electric Company has 20 variable speed induction motor installations, ranging from 40 to 500 horsepower. These installations are operated on voltages from 220 to 4000 volts, as well as two and three phase, with a frequency of 60 cycles per second. The synchronous speeds are 1200, 1800 and 3600 revolutions per minute.

The compressor installations are used to boost gas into the semi-high pressure trunk lines and the volume delivered varies in 24 hours from nine to 100 per cent, except when filling the storage holders. The boosters are used to deliver the gas into the low pressure system and the volume also varies in 24 hours from nine to 100 per cent. The blowers are used for the generators and the demand for air is from zero to 100 per cent in a 10-minute period. The exhauster is used for boosting the gas through the purifiers, station meters, and to the storage holders, and the volume delivered varies in 24 hours from 30 to 100 per cent.

Two Difficulties Met

We have had only two difficulties with the variable speed induction motors. The first was in the installations in the generator rooms where the atmosphere is full of carbon dust. This dust would settle on the collector rings, thereby creating a short between the collector rings and, due to the overload current, would trip out the oil switch. This is now being corrected by using an air-tight enclosure. The second point is that all collector rings should be at least two inches or more apart, whether the collector rings are enclosed or exposed, as we have had difficulty with the pig tails of the brushes shorting across, and this also caused overload currents and would trip out the oil switch. None of the original installations has been

changed except one at the Potrero gas plant, San Francisco, and this was due to the large amount of carbon dust in the generator room, which forced us to install an air-tight enclosure, mentioned above.

For the installations of large motors we believe it is necessary to use high voltage, and in doing so, we have found it impossible to use automatic or hand operated compensators for generator blowers, for intermittent service of frequent intervals. We did, however, install a 2300-volt automatic compensator at the Fresno gas plant, Fresno, in the year 1921 for a generator blower, but this gave us so much trouble that we have never installed another unit, as the maintenance was extremely high and the equipment could never be relied upon.

Description of Tests

The kilowatt hours actually consumed during the tests, which are herein reported, are watthour meter readings, and the meters were tested a week before the test runs were made and were found to be correct.

We have made three test runs at the Potrero gas plant, on a 500-horsepower variable speed induction motor, which is direct connected to a 2.61 pound centrifugal gas compressor and the complete rating of the unit is as follows:

Centrifugal Compressor: Single stage gas compressor; 25,000 cubic feet per minute; 3530 revolutions per minute; 5.8 pounds air pressure; 2.61 pounds gas pressure; .45 specific gravity gas.

Variable Speed Motor: 500 horsepower; 3530 revolutions per minute—full load speed; 2 poles; 3 phase; 60 cycles; 65 amperes; 4000 volts; 808 secondary volts; 274 secondary amperes; 60 per cent speed reduction; 1412 revolutions per minute at 60% reduction.

Test No. 1 was a 24-hour test, running the compressor on variable speed to suit volume and pressure conditions. The actual kilowatt hours for the test were 3240 and the speeds varied from 1680 to 2720 revolutions per minute.

Test No. 2 was also a 24-hour test, but the compressor was run as a constant speed induction motor, throttling the discharge valve to suit volume and pressure conditions. A chart showing the internal pressure of the compressor is reproduced with this article.

The actual kilowatt hours for this test were 5690 and the speed was practically full load speed.

The difference in kilowatt hours for these two tests was 2450 in favor of the variable speed motor. Figuring this on an average rate for energy would show a saving of $8,048.00 per year. In other words, the additional cost of the variable speed motor would be paid for in less than four and one-half months.

For the purpose of obtaining the approximate efficiency of the unit, the actual input at the meter was compared with the theoretical power required for compression.

The theoretical kilowatt hours were calculated on actual discharge pressure and the estimated cubic feet of gas delivered to the system each hour, and we used the same output for each test as the actual plant sendout was practically the same for each day. The formula for this calculation is approximately as follows:

$$HP = \frac{C \times H \times (62.36 \times 1/12)}{33{,}000}$$

$HP = C \times H \times .000158$

$KW = C \times H \times .000118$

C = Cubic feet of gas per minute.

H = Inches of pressure water column.

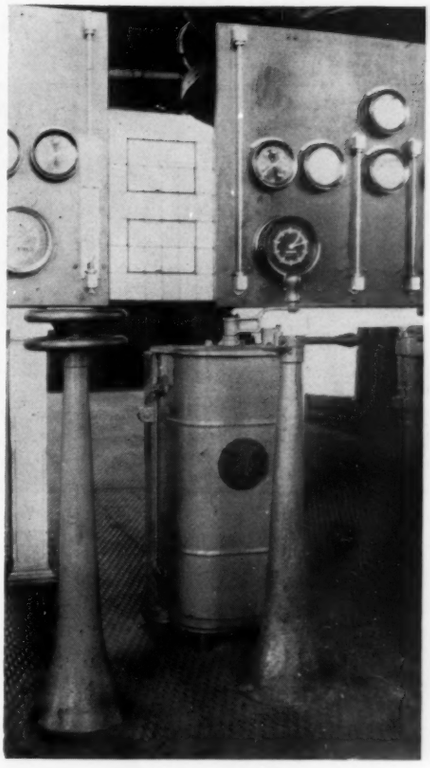
62.36 = Weight of cubic foot of water at 62° Fahr.

1/12 = One inch of water column.

Test No. 3 was a one-hour test, giving the conditions throttling the suction and as the test showed an increase in kilowatt hours, the test was discontinued. The compressor was pulling a 30-inch vacuum.

In order to determine what results could be obtained with variable speed induction motors for driving centrifugal air blowers for gas generators, we made four test runs at the San Rafael gas plant, to show the results when one or two generators are in operation.

The blower used for these tests is a single stage centrifugal air blower, direct connected to a 100-horsepower variable speed induction motor, having a maximum full load speed of 1750 revolutions per minute. At this speed it is capable of delivering 15,000 cubic feet of air per minute at 20 inches of air pressure water column, and the complete rating of the unit is as follows:



Drum controller on operating floor of San Rafael gas plant, direct connected to 100 H.P. variable speed motor

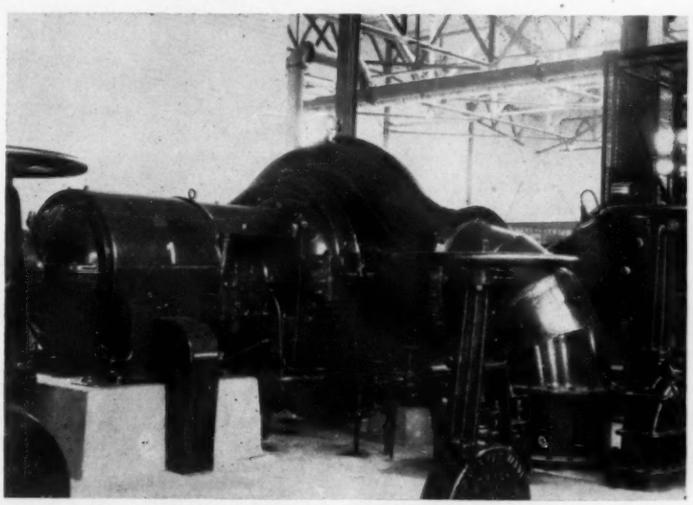
Centrifugal Generator Blower: Single stage air blower; extra heavy design; Up blast; 1750 revolutions per minute; 15,000 cubic feet per minute, 20 inches of air pressure water column; 7,000 cubic feet per minute, 25 inches of air pressure water column.

Variable Speed Motor: 100-horsepower — continuous 40° Centigrade rise; 1750 revolutions per minute—full load speed; 4 poles; 3 phase; 60 cycles; 14 amperes; 4000 volts; 488 secondary volts; 93 secondary amperes; 50 per cent speed reduction; 875 revolutions per minute at 50% reduction.

The first test was run for one hour on variable speed to suit volume and pressure conditions, with two oil gas generators in operation. Thirty-five kilowatt hours were consumed.

The second test was run

(Continued on Page 49)



Motor and 2.61 centrifugal compressor equipment direct connected to a 500 H.P. variable speed motor

Part II *of* WESTERN GAS' Series *on the* Compensation *of* Appliance Salesmen —*the* Flat Bonus Plan

Appliance salesmen of the Pacific Power & Light Company are "backed up" to the limit. These two excellent windows, taken from the company's branch offices, are evidence of the progressive sales policies followed in this important utility of the Northwest

Sell Fords *as* Well *as* Rolls-Royces!

By GEORGE C. SAWYER

Sales Manager, Pacific Power & Light Company

Fords and Rolls-Royces both burn gasoline, says Mr. Sawyer. Also, the gas company exists to sell gas—not merely quality gas appliances. This article follows a discussion last month of another phase of the salesman compensation problem, written by Mr. E. A. Angley, general superintendent of the Utah Gas and Coke Company.

IF you have ever made up your mind for reasons of your own that you wanted to buy a ready-made suit at a certain price, say $35, and when you visited the clothing store and asked the salesman to show you suits of that quality he, instead, called your attention to $60 clothes, extolling their virtues the while, did you like it? Did you finally buy your suit from him? The $60 clothes were better, of course, but there were value and utility in the $35 suit and it was what you wanted.

There is, of course, no question that a Rolls-Royce is an automobile of quality and a reliable unit of merchandise, and yet the Ford car at its price is an outstanding value and combines quality and utility in a remarkable degree. If one were to attempt to argue the desirability of the possession of a Rolls-Royce as against a Ford, the comparison would seem foolish and we would feign remark, "Each car fills a need in its own price class and renders a service to its owner of value in that it furnishes reliable transportation." The matters of comfort, luxuriousness, pride of possession and like factors are important to the extent that the owner is able and willing to recognize them.

To the man that operates the corner filling station, however, gasoline sells for 23c per gallon, upon which price he makes his legitimate profit, and he cares not whether he pumps it into the gas tank of a Ford or the gas tank of a Rolls-Royce. His business is to sell gasoline and whether we use a luxurious palace of transportation or a unit of modest comfort costing a comparatively low price is no particular concern of his. As a matter of fact, if he had his choice, he would probably choose the Fords because there are so many of them, therefore offering to him a greater market for the sale of his gasoline. Between the two extremes are cars of value and reliability that fill a need in satisfying the requirements of certain classes of people, but remember this—they all use gasoline.

George C. Sawyer

Advocating the Flat Bonus

This article is not supposed to discuss the merits of clothing or automobiles and the foregoing examples are merely similies in connection with our method of selling gas. We have been asked to express our views on why the flat bonus method of compensation for salesmen is desirable. In the first place, we believe that salesmen should be compensated for the sale of gas rather than for the sale of any appliance. After all, we are not engaged in the sale of gas merchandise with the same ultimate objective as the ordinary merchandising establishment. Our objective is, of course, the sale of our major product, gas. Many perfectly good gas appliances of low or medium price consume as much gas as their comparatively high priced brothers and return to the gas company just as many net dollars in the till and hence are just as good business. In this regard we are like the operator of the gasoline service station and should be just as much interested in pushing our gas into low priced gas appliances (providing they are of standard and approved design) as into the higher priced units. Furthermore, there are many people in every city who are simply not able to buy the higher priced merchandise. It is a case of purchasing medium or low priced equipment or not at all. If everyone had to buy Packard automobiles or go without, a good many more of us would be walking than riding today.

This brings us to the amount of sales effort expended in attempting to secure the business of the family of modest means or perhaps even meager income. Where a flat bonus is paid for every range installation based not on the price of the range, but on the theory that this

(Continued on Page 25)

Selling *a* Critical Audience *on* Gas *as the* Efficient Boiler Fuel

Stationary Engineers Hear Exposition *of* Advantages Inherent *in* Gas Use

By GEORGE BOWERSOX

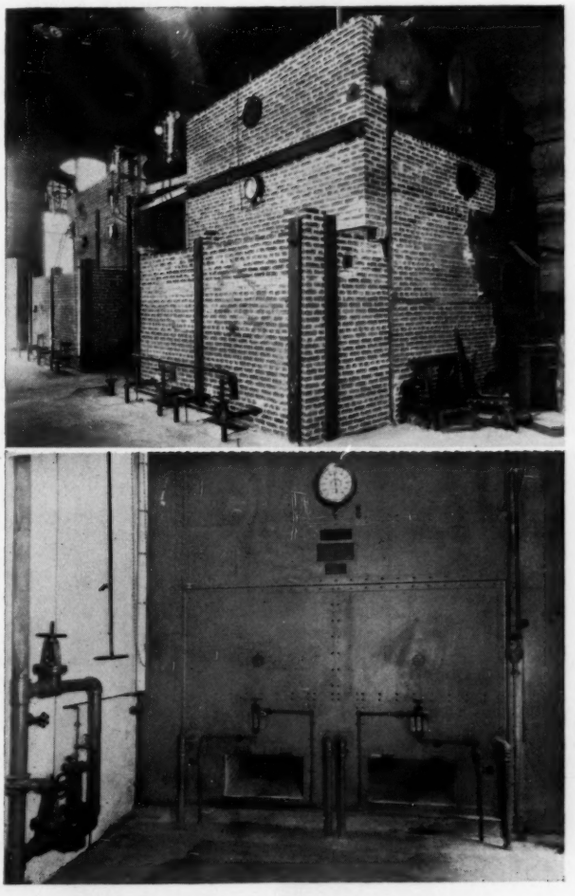
Utilization Engineer, Southern California Gas Company

Most of the effective arguments of the industrial gas salesman will be found summarized in this message to the Los Angeles branch, National Association of Stationary Engineers, delivered at a meeting of May 27th.

THE question of burning gas instead of oil has claimed the attention of practically every engineer. Gas has been accepted by many industrial plants as the most economic fuel. It is not the idea to convert engineers to the use of gas in their boilers, but to have them give this fuel their unbiased consideration.

Almost everyone heartily endorses the conservation of our forests and other natural resources which are fast becoming depleted. The reason is that this conservation is removed far enough so that it does not affect everyone materially. However, when business men are asked to buy gas instead of oil their sense of economic conservation often leaves them immediately and they say "How much can we save?" All can remember some areas which at one time had an ample supply of natural gas. It was probably sold on a basis of so much a month and the consumer used all he wanted in any manner he pleased. Now that particular area is paying a handsome freight rate for coal or oil, whereas if gas had been sold at a rate that was representative of the value of the fuel that it replaced, the consumer would have burned it more efficiently. Don't think there will always be natural gas for boiler fuel, because nothing lasts forever. But if the public conserves and burns gas now it will profit in the future by having a wonderful supply of petroleum close at hand. Can anyone excuse the waste of gas that has gone on in the past years in the nearby oil fields? Yet the reason it was turned into the air was because it could not be sold.

Why should gas be refused in favor of fuel oil when it is admittedly a superior fuel? The cost of installing gas can be paid for in three months to a year from the savings. This means not less than 100% on the investment. After seeing several hundred people double their money in a year on a good sound proposition, offered by as reliable a company as there is in California, almost everyone would be anxious to take advantage of such an opportunity. But when it is a matter of putting $500 to $1000 in gas burning equipment that will pay for itself in a year, the glamor of getting rich quick is gone, though the rate of return is the same.



Top: Boiler plant of Wilson & Co., packers—two 150 H. P. and one 300 H. P. gas fired boilers. Bottom: Gas fired boilers in plant of Peerless Laundry Co.—a 500 H. P. installation, with automatic steam pressure regulator.

Consider the concrete facts of the case. What are the requirements of a good boiler fuel?

1st: It has to be obtainable.

2nd: It must be easily transportable.

3rd: It must be easy to handle.

4th: It must not require excessive auxiliary equipment.

5th: The products of combustion must not be objectionable and good combustion must be easily obtained under all load conditions.

6th: The use of the fuel must not be detrimental to the boiler or refractories.

7th: It must not cost more to use than any other fuel that is obtainable and equally as good.

Since the primary interest is in use of gas compared with oil, the comparison will be drawn for a good boiler fuel from these two —gas and oil.

1. *It must be obtainable.* Both fuels are obtainable in most places, but in some cases there are no natural gas lines and here oil must be used.

2. *It must be easily transportable.* In this case gas is easy to transport within a certain distance because it must be handled in pipe lines, since tank cars are impracticable. For this reason, from an economic standpoint gas should be used and let the people in regions where gas and oil are not produced use the oil.

3. *It must be easy to handle.* Oil is not easy to handle because its delivery in most cases is made by tank wagons and in the downtown areas deliveries must be made between certain hours. But with gas it is always up to the handle and ready to go. By the use of a piece of paper it can be ignited and a cold boiler can be started as easily as a hot one. To use oil the pumps must be started and this requires steam pressure. Also steam must be furnished to the burners to atomize the oil.

(Continued on Page 39)

Investigation *of* Absorption Tower Efficiencies Reveals Variation *in* Testing Practice

A Preliminary Report Delivered *before the* California Natural Gasoline Association

By L. O. WARNER
Signal Hill Gasoline Company

I. INTRODUCTION.

Purpose.

THIS informal report covers the general outline and purpose of the tests, also such conclusions as may be drawn from the data so far acquired. The investigation was authorized for the purpose of determining the relative efficiency of four different types of absorption towers; namely, the Braun Surface-contact Absorber, Campbell Perforated-plate Absorber, Newton Foam Absorber and the Southwestern Bubble-cap Absorber.

In order that the tests might be entirely impartial and more comprehensive, the Signal Hill Gasoline Company invited others interested to participate. Several companies have contributed to the investigation and all data available have been drawn upon for this report.

Outline of Tests

In outlining the tests it was assumed that in a plant having adequate oil denuding capacity, the factors controlling the efficiency would be: 1. Rate of gas flow. 2. Gas pressure. 3. Rate of oil circulation. 4. Temperature of the oil entering. The temperature of the gas entering was purposely omitted as a variable since the temperature of the oil at the bottom of the absorber is considerably higher and would quickly warm the entering gas whose heat capacity is low compared with that of oil.

The proposed experiments would determine the following: 1. Rate of oil circulation required to commercially dry the rated gas capacity of the absorber. 2. The effect of oil temperature upon the gasoline content of the residue gas. 3. Flexibility, i. e. the efficiency at which the oil rate determined (in 1. above) would dry the gas at lower gas rates and lower pressures. 4. Effect of pressure upon efficiency. 5. Pressure drop under variable gas flow and pressure.

After operating the absorbers it was found that the difference between absorbers was slight. It is, therefore, necessary that critical tests be applied to determine their relative efficiencies.

The oil rate requirement is fundamental and after a preliminary study of pressure drop, was selected for the first experiments. This report is concerned only with the oil rate requirements as a variable. Many difficulties were encountered, the most serious being a rapid and permanent decline in the volume of gas available. Tests were started at 20 lb. pressure using the available supply to compare our methods of testing with plant extraction. It was soon seen that relative efficiencies would be more clearly shown if the absorbers were operated at their rated capacity. Additional gas was obtained (through the courtesy of the Signal Gasoline Company) but it was impossible to operate at more than 80 to 90% of the rated capacity of 3,000,000 cu. ft. per day under 30 lbs. pressure.

Paul D. Barton *J. A. Campbell* *J. S. Watson*

Formal Organization Effected *at* First Annual Meeting *of* Gasoline Group

THE report on absorption tower efficiencies which appears on this page occasioned a great deal of interest among those who heard it presented before the annual meeting of the California Gasoline Association. It is the fourth of a series of contributions from the laboratory of the Signal Hill Gasoline Company to be submitted to the association by Mr. Warner, and is offered as a preliminary report on the important investigation which is under way in the field of absorption tower efficiencies.

The meeting of the California Gasoline Association at which Mr. Warner's report was made was held in Los Angeles on June 16, and concluded the association's first six months of provisional organization. Seventy-one members and prospective members gathered at the combined dinner and business session, to bring about the formal organization of the Association.

At the June 16 meeting a constitution and by-laws were adopted and election of officers for the succeeding year was held. The entire slate of officers elected to

(Continued on Page 34)

II. TEST PROCEDURE.

Length of Tests.

A brief outline of the procedure used in the tests and the methods of obtaining samples follows. Approximate conditions were maintained for a period of several hours in order to allow the oil to come to equilibrium. The duration of each test was two and a half hours and during that time 10 readings were taken of plant temperatures and pressures to obtain the average. This period was selected as being ample to allow average samples to be taken and at the same time short enough that conditions could be maintained constant within reasonable limits. The factors desired constant were maintained as closely as possible throughout each test. The greatest variation was in the rate of gas flow which fluctuated 18% in one test but averaged only 3.9%.

Measurements

Gas flow was measured by orifice meters on the inlet and outlet of the absorbers. Oil flow was measured by a temperature compensated Bassler Liquid Meter. During the tests an orifice was installed to measure the volume of vapors from the recompressor vent.

Sampling

Continuous samples of inlet and outlet gases were collected over water in tanks holding approximately 150 cu. ft. Charcoal adsorption samples were made from these gases after the tests. Samples were also taken during the tests. Samples of oil to the absorber and from the absorber were taken continuously into containers. The fat oil was held under a pressure of 20 lbs. during the test and the pressure slowly dropped to zero before the samples for distillation were withdrawn. Oil samples were also taken directly from the absorbers.

III. COMPARISON OF TESTS WITH PLANT

In these preliminary tests we changed our methods of testing when experience indicated. Because of these changes and the operation of absorbers at various pressures and capacities, the available data constitute a better comparison of testing methods than of absorbers.

Plant Extraction

The plant extraction measured over short periods was very erratic because of gas pockets in the condenser and was not considered a reliable measure of efficiency. In certain tests the plant was operated for 24 hours to obtain the rate. The gas obtained from the Signal Gasoline Company was consistently of higher quality, which caused the net plant extraction to vary depending upon the amount of outside gas used. The plant extraction was also consistently higher than would be indicated by any tests. This may be due to three causes: 1. Inclusion of more propane. 2. More efficient condensation in the recompressor than in tests. 3. Re-circulation of some vapors from the rundown tanks which are under pressure.

Comparative Indicated Extraction by Gas Tests

	C-O Lb. Ice	B-30 Lb. 60°F	D-30 Lb. 60°F	A-30 Lb. Ice
Avg. Test..	1.164	1.552	1.671	1.991
Avg. Plant..	1.844	1.708	1.844	2.177
% Plant ...	63.07	90.87	90.62	94.04

Comparative Indicated Extraction by Oil Distillations

	D-O Lb. Ice	E-O Lb. Ice	E-O Lb. Ice	CO_2 Snow
Avg. Test...	1.075	1.312	1.716	
Avg. Plant..	1.844	1.687	1.687	
% Plant ...	58.29	77.77	101.72	

Oil Distillations

The fractionating column and large iced condenser using 3500 cc. samples seemed to give the best results on oil distillations but were consistently below the actual plant productions. Even so, the indicated extraction was 23.2% greater than that by atmospheric charcoal. The net extraction indicated by the net saturation and circulation of oil averaged 77.8% of the average plant extraction. Of the two methods of obtaining more complete condensation, pressure or low temperature, the latter was chosen for simplicity. In the later tests the non-condensable vapors from the atmospheric distillation were passed into a condenser immersed in a mixture of carbon-dioxide snow and gasoline. The total condensate thus obtained when used to compute the indicated plant production averaged 101.7%. This development described in detail by the company which made these tests is worthy of a report in itself. The pressure distillation of fat oil is also being investigated by several companies.

Gas Tests

The gas tests were those used by the companies participating; namely, atmospheric distillation—30 lbs. 60°F. and the 30 lb. iced condenser. The physical refrigeration method gave higher quality on inlet gases but has not proven so satisfactory on very lean gases which are the most important in comparing tower efficiencies. The development of gas tests has been to obtain more complete condensation during distillation. The procedure of evacuating the charcoal before removal from the absorber tube was compared during the tests and clearly shows that in the atmospheric distillation more consistent and higher results may be obtained. Also the time of distillation is shortened by removal of inert vapors before the addition of glycerine.

The net extraction indicated by the atmospheric charcoal tests averaged 65.1% of the plant production. The net extraction by 30 lbs. 60°F. charcoal tests averaged 90.7% of the average plant extraction. The net extraction by 30 lbs. iced charcoal test averaged 94.0%. There was a much larger variation in these net figures than in the average inlet or discharge qualities since the percentage error has been more than doubled by taking the difference between two tests. The atmospheric distillation can not be depended upon to give an indication of the commercial production obtained when the plant employs a recompressor.

The content of the lean gas was fairly consistent by the same operator. When the results of pressure distillations were plotted against the ratio of oil to gas a smooth curve could be obtained which gave no indication of an equilibrium at the highest oil circulations employed (60 gal. per M cu. ft.). In the case of the atmospheric distillations, however, indications of equilbrium were obtained with about one-half the maximum oil circulation employed. The variations thereafter appeared to follow the gasoline content of the lean oil.

Gas fractionations were not employed in these preliminary tests although arrangements were made through the courtesy of the Carbide and Carbon Chemicals Corporation. These tests are more reliable and give more information than any other method of gas testing and no doubt will be used when tests are resumed.

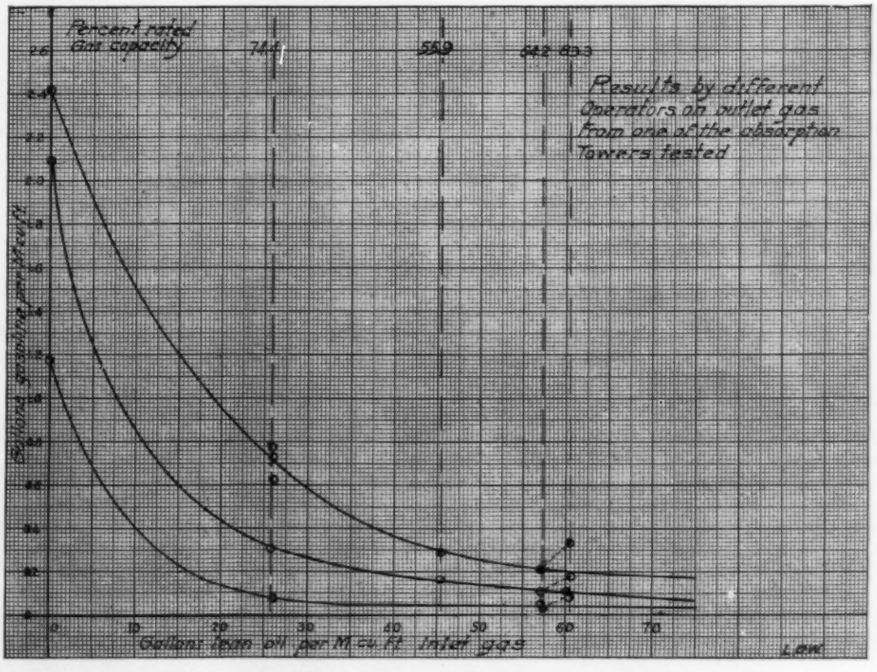
Gasoline Tests

Engler distillations upon the gasoline produced by the plant afforded no measure of the absorber efficiency. The recovery varied less than 5% when the oil to gas ratio was varied 223%. The vapor pressure at 100° varied less than 3 lbs. when the oil to gas ratio was varied 319%. This is no doubt due to the operation of the recompressor under constant conditions throughout the tests.

IV. SPECIAL COMPARISON TEST.

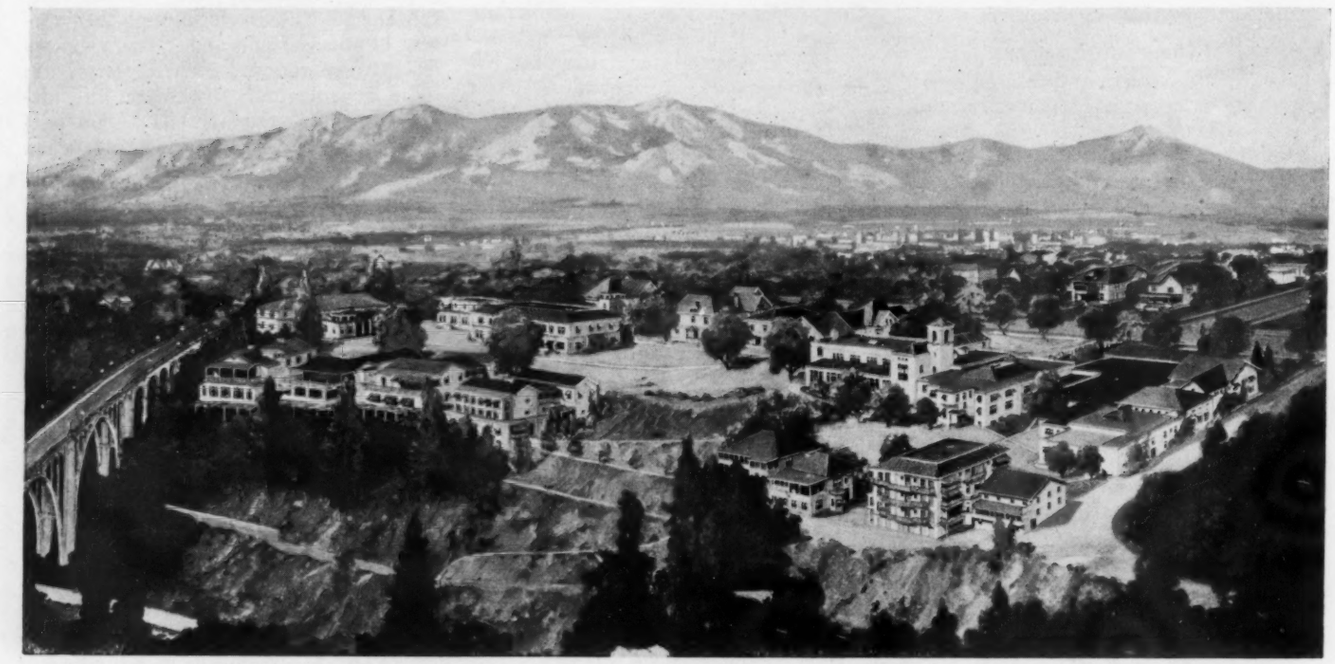
The variation in charcoal tests reported by different operators suggested a comparison in which the absorption variables were eliminated as far as possible. Two lean gases of different quality were used. Gas designated "A" contained 0.3 GPM and "B" 0.42 GPM. Two hundred gram samples of uniform new charcoal in one inch tubes were saturated to the top of the fourth temperature rise with gas from the holders at a constant rate through the same

(Continued on Page 45)


Percent rated Gas capacity
744
559
642 833
Results by different Operators on outlet gas from one of the absorption Towers tested
Gallons Gasoline per M cu ft Inlet gas
Liters

PACIFIC COAST GAS ASSOCIATION

A Department Conducted by Clifford Johnstone, Executive Secretary



Reproduced from an artist's oil painting, this view shows admirably the 12-acre site of the P. C. G. A. Convention Headquarters —The Vista del Arroyo Hotel and Bungalows, Pasadena, Calif. All of the buildings shown in relief are Vista properties.

Come Prepared *to* Enjoy *the* 33rd Convention

ALTHOUGH W. M. Thompson, chairman of the committee on arrangements for the Thirty-third Annual Convention of the Pacific Coast Gas Association, which is coming to Pasadena, Calif. to hold session from August 23 to 27, inclusive, has thrown an impervious shroud of secrecy around the entertainment features which come under his jurisdiction, *Western Gas* is fortunately able to do some predicting for the benefit of its readers.

Accommodations Excellent

H. J. Romer, manager of the beautiful Vista de Arroyo hotel and bungalows, where Convention Headquarters are to be located, assures us that convention delegates will find nothing lacking in accommodations. It is difficult to imagine a hotel site better suited to house a P. C. G. A. meeting. Not only is the Vista commodious, with its many bungalows, but it is ideally located on the east bank of the Arroyo Seco. Los Angeles is only a few minutes drive distant.

SAVE DATES FOR THE SESSIONS AT PASADENA—AUG. 23

Reservations

Every member of the association will receive a card from the Secretary's office, asking information on hotel requirements. These cards, which should be returned promptly, will enable the committee on hotel reservations to provide accommodations to the satisfaction of all.

Mr. Thompson's general committee is already recruited, and actively at work on details of entertainment. Although we are not able to place the official stamp upon the following forecast of events, it will be at least a glimpse behind the curtain—enough to indicate that this Thirty-third Convention is not one to be missed.

Bring the Ladies

Visiting ladies will be well cared for, arrangements to that end being under the able direction of Mrs. Norman R. McKee. There will be a ladies' reception at the Vista del Arroyo on Monday, August 23; a trip to some nearby beach on one afternoon, with a luncheon at one of the numerous available beach clubs, and a bridge luncheon at the Annandale Golf Club is also on the schedule of ladies' events.

General Entertainment Features

The ladies will, of course, share in the general entertainment features which include an afternoon automobile sightseeing tour through Pasadena, Hollywood, and the beaches, with the possibility of an inspection of one of the major studios of Hollywood. The Catalina Island trip, which will come on Wednesday, will be an all-day affair, with a world of varied amusement—from glass-bottom boat trips to relexation at the beautiful St. Catherine Hotel—to entertain the voyagers. Every night during the convention there will be dancing at the Vista del Arroyo for the entertainment of Convention guests.

For the Men

For the men there will be four days

of meaty Convention sessions, with opportunity to renew old acquaintanceships and make new ones among the gas men present. Dancing each night at the Vista, with a plentiful sprinkling of golf at the Annandale Golf Club, close by, will provide the needed contrast to serious Convention business—and speaking of golf, the Annandale course is known far and wide as one of the best in Southern California, which is saying a lot. Arrangements have been made for the use of the course for all Convention golf, and this year's tournament should eclipse all past ones for number of entries and quality of competition. It is rumored that the ladies will have a tourney all their own.

Then Friday night comes the big banquet which concludes the Thirty-third Annual Convention. The Vista del Arroyo cuisine is remembered favorably by all who have ever sampled it, and the inner man will be well cared for during Convention days. As to the entertainment side of the final banquet, we are not authorized to disclose all that we know. Suffice it to say that although there will be no bath-tub scenes there will be something just as intriguing to the gas man.

This forecast of convention arrangements is necessarily sketchy, but it is clear that Pasadena awaits Pacific Coast Gas Association members with open arms. Missing this convention means a life long regret, and western gas men should take no such chances.

New Class C Members

Three firms have recently taken out Class B memberships in the Association. They are:

American Gas Products Corporation, 376 Lafayette St., New York City, represented by H. Leigh Whitelaw, vice-president. Mr. William L. Hoyt, Pacific Coast representative of this company, with offices at Second and Townsend Streets, San Francisco, has joined the Association as a Class C member.

Burroughs Adding Machine Company, 1058 So. Olive St., Los Angeles, represented by Aloys Knaff, utilities specialist.

Hammar-Bray Company, 26th Ave. and E. 12th Streets, Oakland, represented by C. Roy Ohnimus, sales manager.

NATURAL GAS ASSOCIATION ANNOUNCES OFFICERS

The Natural Gas Association of America has announced the following officers, elected at its 21st annual meeting on May 20: President, R. W. Gallagher, vice-president. East Ohio Gas Company, Cleveland; vice-president, N. C. McGowen, Shreveport, La.: directors, James F. Dye, Pittsburgh, and Raymond Cross, Oil City, Pa.; secretary-treasurer, Guy F. Batchelor, Pittsburgh.

Sell Fords *as Well as* Rolls-Royces!

Part II *of* Salesmen Compensation Series

(Continued from Page 20)

customer is one more consumer of gas, the salesman is obviously as willing to devote his time and energy to placing the service in the humble home as he is in the more pretentious residence. In our reference to various classes of merchandise, it must not be inferred that we favor the promotion and sale of other than standard appliances of approved design.

Building Load on Present Lines

An examination of the records of most gas companies will reveal the fact that there are a surprisingly substantial number of homes located directly on existing mains that do not use gas service. These represent, of course, the most desirable type of new residential business for the reason that they can be served with a minimum additional capital expenditure. In many cases they are the so-called low priced or modest homes and have never been consistently and enthusiastically worked by the salesman, perhaps for the reason that they did not represent a satisfactory commission possibility to him, or perhaps even for the reason that the company did not carry merchandise suited to the pocket book and requirements of this particular type of customer. It seems quite obvious to us that where the commission on dollar value of merchandise plan is employed it is quite natural for the salesman to devote his energies toward selling high priced merchandise to the class of people that can afford such equipment, to the neglect of the more financially modest type of prospect. By the same token, a very considerable portion of his time is going to be spent in attempting to sell new high priced merchandise to existing customers who are perhaps already satisfied with the cooking unit they have in their home. This is all very praiseworthy, and it is undoubtedly desirable to sell the most up-to-date equipment to our existing customers where possible to do so, thus still further cementing their loyalty to gas; and yet, on the other hand, this must not be done to the neglect of securing absolutely new business which means additional gas delivered from our holders. This is after all one of the prime objects in maintaining a sales force, and we are sometimes prone to overlook this in our method of compensation. As a matter of fact my company pays a commission or bonus to a salesman who secures a new gas customer whether or not he sells any merchandise. In other words, if the salesman develops a desire on the part of the customer for gas service and secures his contract, he receives his bonus for the installation of range or water heater, or whatever the appliance may be, whether or not he actually sells the appliance. In some instances the new customer secures the equipment from a friend, at a special sale, or from some regular dealer, being influenced by some special consideration, but the gas company sells its gas regardless of where the customer purchases the merchandise. Hence, the salesman has accomplished a productive piece of work and is entitled to his compensation therefore.

How the Plan Works

The foregoing applies entirely to our residence solicitation force. A flat salary is provided plus a flat bonus for each range, water heater or other piece of merchandise sold on new mains constructed to supply the business obtained, the amount of bonus varying with the different pieces of merchandise. A higher bonus is paid for the same kind of business obtained on existing mains where no capital investment is required other than the service and meter. This concentrates the salesman's attention upon the class of business we are most anxious to obtain. Our industrial and large commercial business is handled by a well paid, highly trained specialist who devotes the major portion of his time to the development of this class of business, as well as the supervision in a general way of the activities of our regular force of residence salesmen.

Our plan of compensation has been in operation only a few months, but has already indicated to us that we are on the right track and we are satisfied that the class of business we will obtain and the sale of gas thereto will justify the methods employed. We do not feel that this is of necessity the correct method in every instance, but believe the plan worthy of consideration where conditions indicate the existence of "Ford" business awaiting the salesman.

THOMAS D. PETCH DIES IN BAY CITY ON MAY 30

Thos. D. Petch, vice-president and general manager of the Southern Oregon Gas Company, died on May 30 in Oakland, California. His funeral was largely attended by Pacific Coast Gas Association members, and Messrs. C. B. Babcock, Van E. Britton, B. S. Pederson, H. R. Basford, and Don C. Ray were among the pall bearers. Mr. Petch was a charter member of the Association and has long been associated with the Pacific Coast gas industry.

EDITORIAL

More Than a Good Time

IN a number of ways Pacific Coast Gas Association members may look for the unusual in the Thirty-third Annual Convention, August 23-27, at Pasadena, Calif. Since the sessions at Portland the Association membership has grown measurably, and this will be reflected in convention attendance. The Pasadena convention without doubt gives all indication of bringing the largest number of gas men together that have ever assembled in the West. That alone is unusual. But the feature which stands out more than attendance, and above the attractive entertainment program being arranged, is the amount of Association work which will be reviewed this year. A record of real accomplishment will be unfolded at Pasadena, in which hard working committees of the year past may justly pride themselves. Convention-time as never before will be a time for practical education in the best methods in use in our field. There may have been a time when delegates regarded a P. C. G. A. convention purely as a lark, but a serious purpose lies back of the preparation and expense entailed in the modern convention. Come to Pasadena for a thoroughly enjoyable five days; but more than that, come to learn!

Gas Is Good, But It Must Be Sold

IT HAS often been said, and with truth, that sales activity is the life blood of business. This fact is just as applicable to the domestic and industrial gas business as to any mercantile or manufacturing enterprise. Communities, particularly western communities, do not remain static. As population increases the gas lines must lengthen or competitive fuels will eat into the future domestic load. And lengthening gas lines imply accompanying sales efforts.

As industrial centers in existing metropolitan areas expand, and as towns develop into cities with industrial centers, the gas company must be ever alive to the need for intensive selling. Industry must be won to gas, one hundred per cent! There is no room for competing fuels, except where it is impossible to supply gas.

Public Relations and Purchasing

EVEN the purchasing department of a gas company must be guided in its operations by the public relations consideration, says Norman R. McKee, purchasing agent for the Southern Counties Gas Company, speaking before the utility group of the national association of purchasing agents in Los Angeles. Reciprocal purchasing, says Mr. McKee, is a part of applied public relations. The duty to contribute to sectional development implies that "other things being equal, a fair portion of the compensations received must be returned by the public utility to its public."

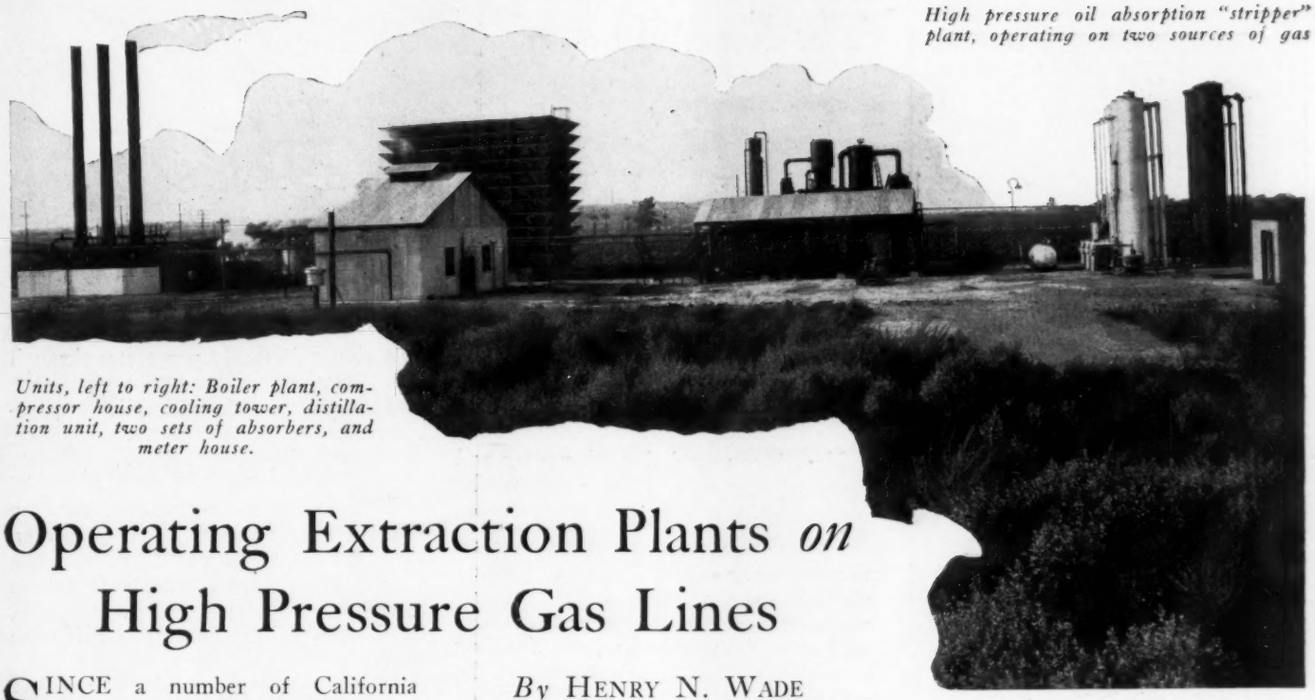
Organizing for a Year of Work

LAST month at its annual meeting the California Natural Gasoline Association passed the first official milestone in its existence, electing officers, executive committeemen, passing upon constitution and by-laws and effecting definite organization for the year ahead. The association's *raison d'etre* is the exchange of knowledge among the technical men in the California natural gasoline industry. That the association is to continue to function, after completing the six month period allotted to its temporary organization, demonstrates that a need for such organization exists—and that the men in the field are willing to cooperate in meeting the need.

It is not too much to say that weighty things may be expected of the California Natural Gasoline Association. Its membership is recruited from the leaders in the gasoline field—young men, aggressive in seeking for technical advancement in their industry.

Recognition for Utilities

ONE unmistakable indication that American utilities are keeping pace with general progress in industrial and business channels is the growing tendency to include them in the councils of business. There is hardly a trade or industrial association which operates in a field touching a phase of public utility operation which does not include the utilities in its deliberations. In June the Eleventh International Purchasing Agents Convention was held in Los Angeles, and its work was organized to provide a special department for consideration of public utility purchasing problems. When the Pacific Coast Advertising Club members assemble in annual convention this month in San Francisco, there will be a Public Utility Departmental which will be widely attended by utility advertising men. Other examples could be given, all pointing to the fact that utilities are playing the game of business in such a creditable manner as to command the respect of leaders in other fields.



High pressure oil absorption "stripper" plant, operating on two sources of gas

Units, left to right: Boiler plant, compressor house, cooling tower, distillation unit, two sets of absorbers, and meter house.

Operating Extraction Plants *on* High Pressure Gas Lines

By HENRY N. WADE
Natural Gas Engineer

SINCE a number of California operators are working absorption plants on high-pressure main gas lines, it is thought that a brief outline of some of the features of this type of operation may be of interest.

General Plan of Operation

Practically all of the natural gas being served by the various companies in Southern California is treated for the extraction of gasoline vapor before delivery to the companies for distribution. The gas as originally produced from oil wells contains a small amount of the liquefiable vapors of the lighter constituents of the oil, usually consisting largely of heptane, hexane, pentane, butane and propane, with a relatively large proportion of the fixed gases ethane and methane, which latter cannot be held in liquid form under any ordinary conditions of pressure and temperature. In most of the plants treating raw gas from the wells the gas is compressed to a pressure of about 30 lbs. per square inch, and is then brought into intimate contact with oil in an absorber. The oil absorbs practically all of the gasoline vapor from the gas, leaving a mixture of methane and ethane, with traces in decreasing amounts in order of propane, butane, pentane, and possibly hexane. No matter how highly efficient the absorber, slight amounts of these gasoline constituents will remain in the gas. The nature of the absorption phenomena is such that the heavier constituents, such as heptane, hexane, and pentane, will be nearly completely taken out of the gas, while the lighter or "wilder" fractions, butane and propane, will be only partly held by the absorber oil.

After passing through the absorbers the gas is ordinarily delivered to compressor plants operated by the gas companies. Here the gas is compressed so that it can be economically transported through pipe lines of reasonable size to the point of use. Depending upon the distance of transmission, the gas is pumped up to pressures ranging usually from 100 to 1000 lbs. per square inch.

After this second compression, it is possible to again pass the gas through an oil absorber, and recover most of the gasoline vapor which was necessarily left in the gas by the absorbers operating at lower pressure. A crude analogy would be the difference in dryness which can be secured by wringing a wet cloth by hand and wringing it with a power wringer.

Gain in Absorption Efficiency Due to High Pressure

In a typical case the outlet or "dry" gas from the original absorption plant may contain say one-tenth gallon of a mixture of pentane and butane in each one thousand standard cubic feet. Such a mixture can be recovered and kept as gasoline, provided the extremely "wild" propane fraction can be largely eliminated. If this gas is compressed from the 30 lbs. per square inch in the original absorptions to say 200 lbs. per sq. in., it will occupy only about 0.21 as much space or volume as it did at 30 lbs. As a consequence of this compression, then, each cubic foot of the compressed gas will contain nearly five times as much of the gasoline fractions as a cubic foot at the lower pressure. In other words, the gas having a richness of one-tenth gallon per 1000 cu. ft. will give up its gasoline to the oil in the absorber as readily at a pressure of 200 lbs. per sq. in. as a gas containing 0.50 gal. per 1000 cu. ft. would give up at 30 lbs. per sq. in. Thus, even though the original absorbers operate at the maximum possible efficiency, the absorbers of the "stripper" plant will be able to save a small amount of residual gasoline vapor on account of the higher pressure.

Careful Handling Required

Due to the fact that the absorption in the original absorbers is selective, that is, takes out a large proportion of the heavier and more stable fractions, and passes relatively more of the very light fractions, the product from a stripped plant tends to run very high in gravity and vapor pressure. Careful provision must be made in the plant design to give accurate fractionation, so as to keep the product reasonably stable. As much as 30 to 40 per cent of butane can be retained in the final product if propane is eliminated. This can be accomplished by the use of any one of half a dozen or more fractionating schemes well known to the gasoline industry.

Economic Value of Stripper Plants

The economic usefulness of the stripper plant lies in the fact that it converts a material, gas, of one form into another form, gasoline, of greater value. About 40 cubic feet of gasoline vapor is extracted from the gas for each

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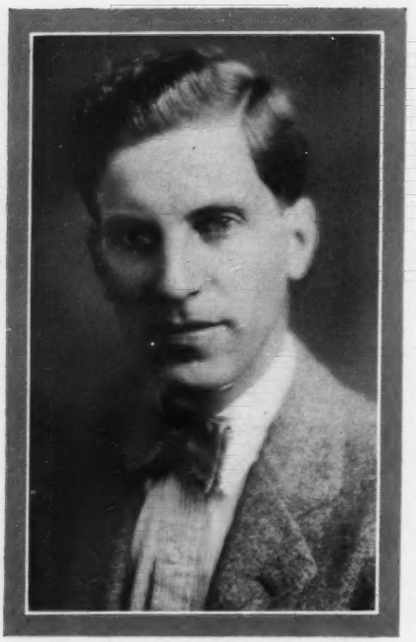


Philip B. Taylor

The Phenomena of Radiant Heat

¶ Mr. Taylor's paper, published on these pages, was delivered in the recent course of lectures conducted by the Gas Appliance Association of Southern California. In it is discussed the development of the radiant gas heater, as well as the characteristics of radiant heat.

By PHILIP B. TAYLOR
General Gas Light Company

F all the elements heat is the most important, for without it any life would be impossible. This heat is generated by the sun, and is known as radiant heat. When one realizes that this energy passes to the earth over a distance of ninety-three million miles at 186,000 miles per second, some idea of its intensity may be realized.

Heat is supposed to be produced by accelerating the motions of the molecules of bodies, and passes from one body to another. However close the molecules may appear they are not supposed to be touching one another, and they are supposed to have a constant motion called vibration. It is supposed that all space, even between the molecules, is filled with an immaterial and invisible substance called ether. This ether conveys to other bodies the heat produced by the vibration of the molecules. When this vibration increases, the temperature of the bodies rises, and when it decreases the temperature falls.

Heat is produced most commonly by chemical action, such as fire. Fire is caused by the union of oxygen of the air with the carbon in the fuel. Heat in the body is produced by the action of the blood and digestive fluids upon the food and also by the action of the oxygen of the air upon the carbon with which it comes in contact in the lungs. There are many ways of producing heat by mechanical action, such as rubbing two pieces of metal together vigorously, pounding a piece of metal with a hammer; rubbing the hands, together, etc. Rubbing two pieces of ice together produces heat, and will melt the ice.

Heat is conveyed through matter and space in three different ways, that is by *convection, conduction* and by *radiation.*

Radiation of heat is the communication of heat from one point to another through space without the use of any mechanical device to conduct it, such as flue pipes, tubes or wires. Radiant heat always goes in a straight line the way it is directed. In the beginning of this article it was stated that heat was supposed to have a constant motion called vibration, and as the vibration increases the heat increases. This vibration, called heat waves, can perhaps be most simply illustrated by dropping a stone into a body of water and watching the waves produced, the waves growing broader and less intense as the distance away from the starting point increases.

Radiant heat may be likened to the wireless telegraphy instrument. Wireless waves are produced and travel through miles of space through storm, rain or snow, against a terrific head wind. Radiant heat carries through space in the same manner exactly, only it consists of heat waves, not electrical waves. Something like radio, it travels on the ether in the air; also, it does not heat the air, thereby losing any of its energy, as radiant heat only heats objects. For example: you have stood around a bonfire built on the ice and been able to see your breath because of the cold air, yet the heat from the bonfire was very warm. Another illustration: You have stood by a window with the sun shining through and perhaps a wind blowing at right angles with the rays of the sun, yet that disturbance of the air did not in anywise affect the intensity of the heat.

A radiant gas heater is the only gas heater known that positively separates the heat and products of combustion. The heat is absorbed by the radiants and thrown right out into the room where directed, and the products of combustion go upward and out through the chimney, if there is one. Radiant heat almost instantly penetrates through heavy clothing, that wards off severe cold winds, and it will quickly penetrate the soles of your shoes.

Radiant Heat Like Light

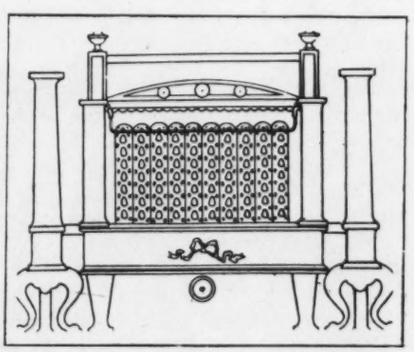
The laws governing radiant heat are alike in every way to those governing light. You would not think of stopping light rays from going in a certain direction with a piece of window glass, or of blowing it away with a draft from an electric fan.

It seems strange, knowing as we have for thousands of years Nature's own method of heating the world by radiant heat, that we did not sooner adapt it to our own use in an artificial way for the heating of our homes by gas. Our forefathers came the nearest to it with the old open fireplace of wood logs, which was the sole means of cooking and heating the entire house. The development of fireplace baskets through such periods as Adam, Queen Ann, etc., indicates their importance in the household. When those logs glowed or were sufficiently burned to a mass of red incandescent coals of fire, they gave off a very intense radiant heat, but the many objections to such a fire, the smoke, the ashes, the dust and dirt, have condemned it.

The Purpose of Heating

The layman holds the idea that artificial heat is provided in our homes and work places in order to impart heat to our bodies. The truth is that the real aim of heating is to prevent the excess loss of heat from our bodies.

This loss takes place in three ways:



The first Humphrey Radiantfire

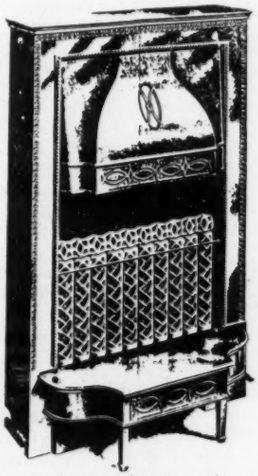
First, when all or a part of the air surrounding the body is cold, heat is abstracted from the surface of the skin, and the energy of the heat goes to warm the air. Second, the body heat is lost through radiation, and this loss is greatest when the temperature of the walls and the furniture in a room is low, as in a room not heated by radiant heat. Third, the heat of the body is dissipated by evaporation from the surface of the skin, and this evaporation goes on most rapidly when the air is dry.

Radiant heat is not a current of hot air coming from the radiant heater, as cool air comes from an electric fan. Quite the reverse, for if there is an air current it is air rushing toward the radiants of the heater to supply the fire with secondary air, while the radiant heat waves are coming right out through the incoming air.

Radiant heat in a room is most agreeable because one can adjust one's position in the room to suit the amount of heat required to keep the body comfortable. Radiant heat diminishes inversely by the square of the distance just as light does.

Radiant heat is not wasted. When it has spent its rays of radiant heat it warms the floor, the chairs, the person, or other objects it comes in contact with, and then in turn heats the air of the room.

The first ventilated gas fire was made in 1905 by a well known English firm in Yorkshire, the idea, however, having been originated by the South Metropolitan Gas Company of London. In 1911, the Davis Company of London introduced the first successful line of radiant heaters.



The English type of radiant gas heater.

Beginning about the year 1898, A. H. Humphrey developed gas lighting from the type of lamp where each mantle was separately enclosed in a glass chimney, to the point where all of the mantles were enclosed in one globe. With this improvement it was possible to invade the foreign markets, and many thousands of them were sold in London, where gas was first discovered. Mr. Humphrey is also the inventor of the inverted type of gas arc. This was considered a great accomplishment, as previously engineers were convinced that satisfactory combustion and utilization could not be obtained using the inverted principle in gas lamp construction. The reason that it was possible to do this was because of the velocity in which the gas was sent into the mantle, made possible through the convexed construction of the mixing tube, really acting on the same principle as a compressor at the gas works.

Mixture of Gas and Air

The mixture of gas and air in the burner of a radiant heater can be improper as in any gas appliance. About five to nine parts of air are necessary to one of gas, and this mixture should contain 100 B. t. u.'s per cubic foot, depending on the kind of gas, so that complete intense combusition takes place. Mixing the air and gas uniformly this way gives the flame temperature required for generating radiant heat in large volume and with speed.

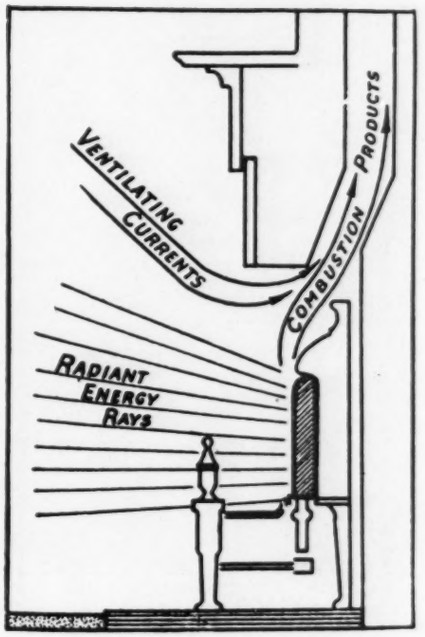
Velocity to the mixture of air and gas is secured in a gas fired furnace for the heat treatment of metal by using compressed air to speed up the explosion and thus get a high flame temperature. In the same manner, the velocity of the mixture in a radiant heater determines the flame temperature, as the gas only contains so many B. t. u.'s per cu. ft. and the more explosions per unit of time means higher flame temperature and more radiant heat, if the heat is contained in porous radiants.

Circular No. 70, U. S. Bureau of Standards, points out that the odors from any gas fire are occasioned from one or both of two causes: imperfect burner construction (the most common fault), or perfect burner construction with the flame impinging on metal, such impingment causing cooling of the flame temperature, which produces products of incomplete combustion and allows particles of gas to pass by and through the burner, not totally consumed.

Flame temperature alone determines the volume of radiant heat to be had from a radiant gas heater, because it is the temperature of the radiants that is felt as radiant heat and in exact proportion to the temperature of the heat source at the burner tips. It is possible for a radiant heater burner to produce 90 per cent radiant heating efficiency in combustion.

Design of Radiants

Radiants are so designed as to provide enough area inside for the flame to cover and absorb its heat so there is no flame or odor to the air leaving the radiants. Their location is so as to allow perfect secondary air entrainment both around the burner tips and back of the radiants to support combustion. Their function is to hold the heat and radiate it into the room, and to the extent that the radiants are porous they accomplish this function, and the texture of the clay determines their length of life.



Radiant rays, like light rays, cannot be turned aside, nor can they go up the chimney. They come steadily forward warming, not the air, but only objects with which they come in contact. They give warmth, and at the same time set the air in motion and provide perfect circulation and ventilation.

The backwalls are designed to force the heat in the radiants out into the room, and so situated as to completely surround the radiants. Their function is to resist the heat and not absorb it. Their composition is opposite from that of the radiants, being hard to heat.

To light a radiant heater the radiants should be allowed to fill, and then apply match at top. If a hose is used a shut-off valve at the wall should be used so the pressure won't be on the hose. Never sleep in a room with the heater going, and always provide ventilation, whether heat is on or not.

Elements of Cost

The elements of cost in a radiant heater consist of the size and finish and location for connection. Radiants should be renewed each year, so that their functioning is unimpaired, as in time the heat causes disintegration.

In one minute from the lighting of a radiant heater, its grateful warmth is felt, 90% of its heat being radiant rays, and only 10% passing off as convected heat; yet the air movement that is set up, passing over the heated surface of

A view of Sir Walter Scott's library at Abbotsford, England.

the fire through which the radiant heat goes, lends itself to tempering the room temperature, and the radiant heat is directed just where it is wanted.

Determining Heating Requirements

The following rule will determine the size and number of heating appliances necessary to heat any given room or number of rooms to a temperature of 70 degrees F.

A suggested rule for figuring B.t.u.'s required for heating 70 degrees Fahrenheit in zero, by the National Warm Air Heating and Ventilating Association is:

Each 400 cu. ft. of contents requires 1000 B.t.u.'s per hour.

Each 40 sq. ft. of wall surface requires 1000 B.t.u.'s per hour.

Each 12 sq. ft. of glass surface requires 1000 B.t.u.'s per hour.

On this basis the radiant heater should heat to 70 degrees in zero, rooms having average glass surface and exposed wall surface as follows:

5 radiants, 10x12x9—2 windows, 2 exposed walls, 11,400 B.t.u.'s;
7 radiants, 12x18x9—2 windows, 2 exposed walls, 15960 B.t.u.'s
10 radiants, 15x24x9—3 windows, 2 exposed walls, 15,960 B.t.u.'s
or 400 cubic feet per radiant.

The radiant type of gas heater is a clean, odorless heater, and radiants which become incandescent are beautiful to behold, and have the same fascination as a coal or wood grate without the latter's dirt and ashes. The homemaker dislikes to litter up expensive furnishings with particles of kindling, coal, dust and ashes, even when the real work of taking care of the fire can be assigned to the servants.

The ordinary furnace-scoop holds about 15 pounds of coal. Coal at $10 per ton costs one-half cent per pound, and every shovelfull cuts into you just seven and one-half cent's worth. Seven and one-half cents will pay the bill for running the radiant fire two and one-half hours.

The Advantages of an Open Fire

Most people enjoy the cheerful glow of an open fire, and yet today few homes in our large cities and towns have open fire places, except as ornaments. Coal is out of the question because of the resulting smoke and waste of fuel values. Wood fires have become more or less of an occasional luxury with the tendency toward the complete elimination of this type of fire. Radiant heaters have all the advantage of wood and coal from the standpoint of adequate ventilation, and in addition they insure economy, convenience, constant fuel supply and cleanliness.

The idea of developing the radiant heater was to not only make a better gas heater, but to make a thing of beauty; capable of being permanently installed and of serving constantly as an instantaneous available utility.

Aids Ventilation

The radiant gas heater, while eliminating atmospheric pollution with all its accompanying evils, at the same time aids ventilation, and yet does not produce any abnormal drying effect or vitiate the air. The flue gases from a modern gas fire do not contain carbon monoxide, which indicates how fallacious is the notion that gas contaminates the air with harmful fumes.

It is no wonder, in view of such facts, that the British people who delight in open fires have gone in so largely for the radiant gas fire. No better endorsement of gas heating can be presented than the statement that the highest consumption of gas per unit area in any residential district in the world, is in the Harley Street section of London, which neighborhood contains the offices and homes of England's leading physicians and surgeons. Surely the medical profession would not go in for gas heating if this method did not provide perfect hygenic conditions.

No combustion can occur without a plentiful supply of oxygen, and the big roaring wood fire, which no one ever thinks of condemning along hygenic lines, is consuming oxygen at a tremendous rate; but there is nothing to worry about in that. Any room that is fit to live in at all should constantly receive a fresh supply of air.

The factors that mainly govern the comfort of a living room are:

1. Air Temperature,
2. Radiant Temperature,
3. Relative Humidity,
4. Air Movement.

The ideal method of heating our home would be to keep the body warm and the air of the room cool for breathing purposes. This can be accomplished by the use of radiant heat.

It has been scientifically proved that if the radiant temperature is low, the human body will lose to the surrounding objects a disproportionate amount of radiant energy, and a corresponding sense of discomfort will result—as is exemplified by the chilly sensation one experiences when in close proximity to a large column of ice.

For a room to be comfortable, therefore, *radiant temperature must be maintained.* It has long been recognized that the relative humidity of the air in a room determines to a very great extent the amount of heat given off by the body and therefore the degree of comfort experienced. A high relative humidity tends to reduce heat loss and check natural skin evaporation, thus causing a feeling of stuffiness and excessive skin moisture. A low relative humidity, on the other hand, promotes undue evaporation, resulting in uncomfortable skin dryness and irritation of the mucous membranes.

For a room to be comfortable, therefore, *normal humidity must be maintained.* The influence of air movement is closely associated with that of humidity, since, if the bulk of the air in a room is practically stationary, though otherwise in a satisfactory condition, the temperature of that part of it immediately surrounding or filling the space between occupants, tends to rise and its relative humidity to increase, with the unpleasant consequence stated above.

Hence, for a room to be comfortable it is also necessary that *air movement should be properly promoted.*

How Radiant Gas Fire Helps

The radiant gas fire effected a vast improvement on the older types in the matter of room comfort, for the following reasons:

1. Air heating was greatly reduced, as regards both volume and temperature.
2. Radiant temperature was correspondingly increased, by the heating of the walls, furniture, etc., as distinct from the air itself.
3. Normal humidity was maintained, in that increase of air temperature was limited.
4. Air movement was promoted by air change due to improved ventilation, and by secondary convection currents set up by the heating of walls and furniture.

In the matter of ventilation the gas fire reaches a state of perfection not equaled by any other form of heat. The electric heat stagnates the air, while the coal fire provides a wasteful excess of air movement. As one investigation disclosed, the volume of the current up the chimney from a coal fire averages 17,500 cubic feet per hour, changing the air of the room 10 times every hour. The rapid movement of the air causes a substantial loss of heat, occasions drafts and results in poor ventilation due to a short circuiting of the air between the doors, windows and the chimney. With radiant gas fire the volume passing up the flue is equivalent to an average change in the air five times an hour, which condition is most satisfactory from the standpoint of body comfort and health.

The influence of air temperature on bodily comfort, and the fact that contact with heated air seriously interferes with the natural loss of heat from the body, are aptly demonstrated by the different sensations experienced (1) on a day when the sun is blazing hot, but a fresh breeze is

(Continued on Page 49)

HOLBROOK, MERRILL, STETSON BUYS CAIN RADIATOR CO.

Holbrook, Merrill and Stetson, Los Angeles distributors of gas ranges and other equipment, have purchased the W. H. Cain Radiator Company's plant, in the Goodyear Rubber Company's tract, the transaction now being in escrow. Holbrook, Merrill and Stetson will continue the operation of the plant, introducing a new line of gas ranges in a number of sizes and styles and marketing them under their copyrighted name of "Pacific." The Cain Company's line of radiators will be continued, according to N. T. Dennis of Holbrook, Merrill and Stetson, and it is probable that a line of heaters will be manufactured. This active entrance of his company into the manufacturing of gas burning equipment comes after 75 years' participation in stove merchandizing on the Pacific Coast, says Mr. Dennis.

PAUL D. BARTON LEAVES UNITED TO ENTER CONSULTING PRACTICE

Paul D. Barton, until July 1 manager of the gas department of the United Oil Company, has left that organization to go into consulting work in the technical end of the natural gasoline and natural gas fields.

Mr. Barton, a graduate of the University of Oklahoma and the California Institute of Technology, and member of the Phi Beta Kappa and Phi Gamma Delta fraternities, has been prominent in his industry for a number of years and is thoroughly familiar with its problems. His consulting work will include operation of gasoline plants, gas analysis and other angles of the technical natural gasoline industry.

As one of the organizers of the California Natural Gasoline Association, Mr. Barton has already contributed much to progress in this field. He is now serving as president of the above organization, which is of growing influence among natural gasoline engineers.

IMPORTANT GAS EQUIPMENT ADDED ON PORTLAND LINES

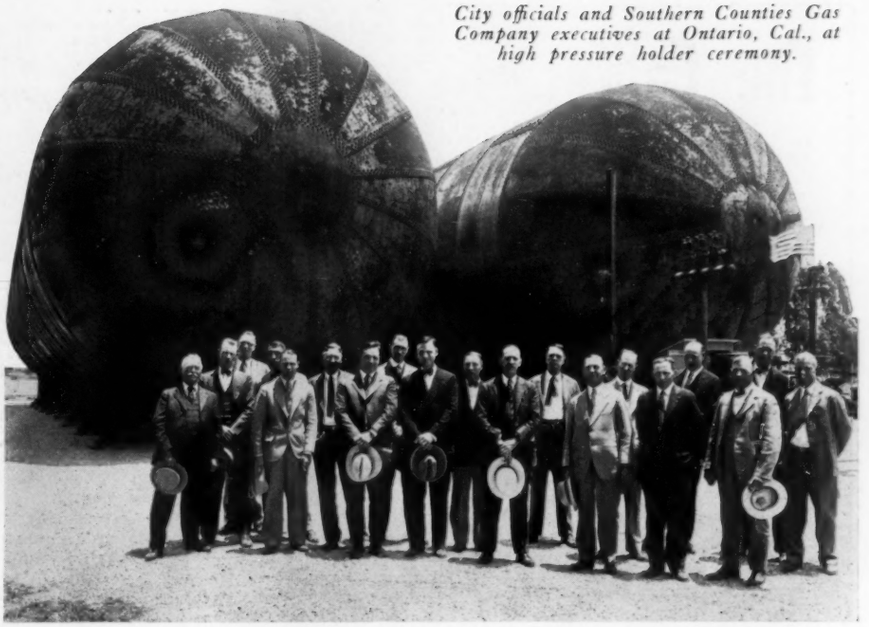
The Portland Gas & Coke Co. installed two more Gasco Bake Ovens during the past month. The ovens are manufactured in their own shop and are proving very satisfactory. Gas burner equipment was also installed for a large tar tank used for dipping pipe. Estimated gas consumption will be about 1,000,000 cu. ft. per month. Three gas-fired boilers were put in service during May to supply steam for electric bake ovens.

The three waste heat boilers installed at the Portland Gas & Coke Company plant some months ago are proving very satisfactory, according to E. L. Hall, general superintendent of the company.

CLYDE POTTER TO PARTICIPATE IN AD CLUB CONVENTION

Clyde H. Potter, in charge of the advertising and publicity department of the Southern Counties Gas Company, will leave for San Francisco Sunday, July 4th, to participate in the annual convention of the Pacific Coast Advertising Club's Association, which will convene in that city, July 5th-8th. Mr. Potter is particularly interested in the Public Utilities Departmental, which will be represented by advertising men from various Pacific Coast public service corporations.

One of the features of the annual Advertising Association Convention is the advertising display in which the Southern Counties Gas Company, along with other Coast utilities, will exhibit samples of its public relations, service, good will and appliance advertising.



City officials and Southern Counties Gas Company executives at Ontario, Cal., at high pressure holder ceremony.

Gas Company Launches High Pressure Storage Service *by* Novel Ceremony

A UNIQUE ceremony was staged at Ontario, California, recently when the two high pressure storage holders of the Southern Counties Gas Company were placed in service. More than 20 city officials, representatives of various civic bodies, together with executives and employees of the company, participated in this event, which formally placed in service the company's late model high-pressure storage tanks.

The ceremony opened at 11 o'clock on the morning of June 15th, when District Manager C. G. Spencer, in charge of the company's Pomona Valley properties, welcomed the city officials at the holder site and invited them to witness the placing in service of the corporation's new equipment. Mr. Spencer then introduced Executive Engineer A. F. Bridge, who, with M. R. Thompson, the utility's chief engineer, designed the high pressure gas holder. Mr. Bridge spoke briefly on the operation of this type of equipment, stating that the company had pioneered the high-pressure type of holder in large units and had originally erected its first holder of this design at Azusa, California, in 1921.

Other Extensions Due

He said that during 1925 the company had made a careful study of its storage problems and that between now and 1930 the Southern Counties Gas Company would install holders of this type of several million cubic feet capacity at various load centers on its system. High pressure holders have already been erected at Newport Beach, Santa Ana, Orange, Sierra Madre and Ontario. The two Ontario units have a combined storage capacity of 500,000 cubic feet and were erected at a cost of $57,000. Due to the fact that the new holders are automatic and require no compressing machinery, the annual cost of operating them is considerably less than with the old telescopic type.

The new type of holder has several advantages over the telescopic type used generally throughout the country by the gas industry. High pressure holders have no moving parts, are automatic in operation, and greatly increase the flexibility of storage operation generally. The two units are horizontal, cylindrical steel tanks, 28 feet in diameter and 145 feet in length. They are of riveted steel, designed with a safety factor of four when filled with gas at 50 pounds pressure. The thickness of the cylindrical portion is 21/32" and of the hemispherical end, 13/32".

These high pressure holders are filled directly from high pressure transmission lines and discharge into the local distribution system without any additional compression of gas. They are protected with pop valves, set to blow slightly above 50 pounds. The content of the two holders may be emptied in a few minutes in case of emergency. The principle of the design was worked out by Engineers Thompson and Bridge in conjunction with engineers of the Western Pipe and Steel Company. The materials were fabricated in the Los Angeles plant of the Western Pipe and Steel Company, and assembled on the job.

Following Mr. Bridge's talk, Mayor F. F. Williams of Ontario turned a valve which permitted the first natural gas to flow from the two new holders into the company's Ontario and Upland gas distribution systems. The officials present then adjourned to Carders Inn at Ontario, where a luncheon was served. General Agent F. H. Bivens of Los Angeles related some interesting history in connection with the Southern Counties Gas Company and its operations. In his talk Mr. Bivens said that the company entered the local field in 1917 with the purchase of the gas properties at Upland and Ontario from the Upland-Ontario Gas Company.

A similar ceremony was recently held at Santa Ana, where the Southern Counties Gas Company placed in service four similar units with a combined storage capacity of 1,000,000 cubic feet.

The California

Hot Water in One Minute

Two Sizes for 30 to 60 gallon tanks.

Two Colors, Black Japan or Gray Enamel

A Western Product

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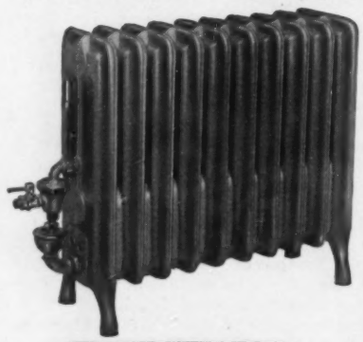
THE LATEST



Hammel

Gas Steam Radiators

Unit System of Heating — Steam Heat in Ten Minutes

WE ARE now able to offer some very profitable territory to dealers who can qualify. The *Hammel* line offers a very liberal profit and its repeat orders will build a substantial business for you.

Good Territory for Live Dealers Write for Literature

Hammel Radiator Corporation

715 So. Figueroa St. Los Angeles

The Gas Utilities *in* Los Angeles *Are* Prepared *for* Emergencies

THE Chamber of Commerce in Los Angeles has started a movement to develop within the utilities an organization and a fixed plan to meet a community catastrophe.

Fire Chief Ralph J. Scott has been delegated as chairman to arrange the details and coordinate the efforts of the various utilities concerned. It is intended to line up the water, electric, telephone and gas companies, each group of utilities to organize within itself a definite plan of attack. The gas companies have selected a committee consisting of B. G. Williams, engineer of the Southern California Gas Company; O. R. C. Grow, district manager, Southern Counties Gas Company, San Pedro; W. M. Henderson, superintendent, Los Angeles Gas and Electric Corporation; J. C. Gilbert, district manager Southern Counties Gas Company, Santa Monica. This committee is now functioning under the direction of Chief Ralph J. Scott, and working out a suitable organization to meet any major emergency.

Briefly, the scheme is to establish a suitable base for operations within the City, and two or more branch bases for convenience. At such locations there will be maintained charts of the gas works and holder stations, showing outlet control only, as well as a chart of the distribution system main line valves. A complete record of the personal responsibility for operations within each company will be included in the general plan. This information will be at the disposal of the Fire Chief together with two or more representatives of each company, who by pre-arrangement will be on hand at the base immediately, should a catastrophe visit the city. These men will serve the Chief and enable him to keep close touch with the gas company organizations.

The whole proposition is an excellent thought. Those who conceived it, as well as those who are now working on the details, are deserving of much credit.

Pacific Gasoline Stock Bought *by* Standard Oil

FOLLOWING by a few weeks the announcement that the California Petroleum Corporation had acquired the California Gasoline Company comes word on June 8 that the stock of the Pacific Gasoline Company has been purchased by the Standard Oil Company of California. Both of these developments are of outstanding importance in the California natural gasoline industry, in view of the size of the gasoline companies involved. The Pacific Gasoline Company is the leading manufacturer west of the Mid-Continent fields, with a daily production capacity conservatively placed at 150,000 gallons.

An important consideration of the transaction which lines the Pacific up as a Standard unit, it is said, is that the present officers and personnel of the company will remain intact, Harry J. Bauer, president of the Pacific, continuing to serve as active head of that organization.

It is estimated that at least 50 per cent of the present production of the Pacific Gasoline Company is made from natural gas produced by wells on Standard Oil property under leases or contracts.

The Pacific organization dates back to 1912 when W. J. Wallace established the first plant in the Brea fields, out of which grew the company operating under the name of Wallace Refineries. Several plants were constructed during the next few years in the Midway fields in the Taft district, expansion being confined to that section until 1923 when the company entered the Southern California fields at the time they were brought in. Consistent expansion with the development of the oil industry in California has marked the course of the company.

In the fall of 1921, when the company was operating nine plants in the California fields, H. J. Bauer became president of the organization which took over the Wallace Refineries as the Pacific Gasoline Company. Since that date many additions to plant equipment have been made and new properties acquired, the company now owning 28 active plants. Two plants of the Long Beach Gasoline and Refining Company were added to the system in January of this year.

JOHNS-MANVILLE INC. OF CAL. MOVES SAN FRANCISCO OFFICE

On June 19 the San Francisco office of Johns-Manville Inc. of California was moved from its location at 500 Post St. to 159 New Montgomery St.

MARYSVILLE PLANT RAPIDLY NEARING COMPLETION

The water gas generators for the Marysville plant of the Pacific Gas & Electric Company have arrived and are installed on the foundations. Present indications are that the plant will be in operation about the first of September.

RAY DUUS NEW SECRETARY OF SAN FRANCISCO SOCIETY UNIT

Paul N. Harlan, secretary of the San Francisco Unit of the Gas Appliance Society, is turning over this post, effective the first of July, to Ray Duus, of the gas sales division of the P. G. & E. Mr. Harlan is severing his connection with the gas industry to take a place in the sales department of the Sunstrand Adding Machine Company.

PORTLAND GAS AND COKE CO. ELIMINATING LEAKAGE

An intensive leakage elimination program undertaken this year by the Portland Gas & Coke Company includes a thorough examination of all service piping above ground, and the digging up and examining of all connections and joints on both mains and services where leakage is suspected or is indicated by surface conditions. It is planned to cover the entire system in this manner, and it is estimated that four years will be required for completion. Fifteen men are being used on the work at the present time. Results of the operations of the first three months indicate that the cost of the work will be returned in leakage saving in less than two years.

UNITED CARBON CO. BUYS GAS RIGHTS FROM UTAH COMPANY

United Carbon Company has bought from Utah Oil Refining Company the natural gas right on 5,000 acres near Cisco, in Grand county, Utah. Sale includes the Cisco gas well, which is producing a steady flow of 20,000,000 cubic feet daily.

How Many Sales Are You Losing?

Prospect—"Yes, maybe your appliance would be just as good, but it's not the type I wanted. I think I'll look around."

Appliance Dealer—"Another customer lost because my appliance isn't just what he wanted. I wish this firm made a more complete line."

If you're trying to supply the gas heating needs of your community with one or two appliances, you're bound to lose a lot of sales!

In making hundreds of thousands of installations in the Los Angeles territory, we have found a need for at least six distinct types of appliances—and several sizes of each of these.

Now prospects come to us to find out which type is best suited to their needs. And we have first chance to sell them—because we always have exactly the type of appliance they need.

Now we are rapidly establishing other "Pacific Gas Heating Headquarters" in other cities—and dealers who used to lose sales now can sell **every** job they run across. They can prove to the prospect that the particular Pacific Appliances they recommend are best suited to his heating needs.

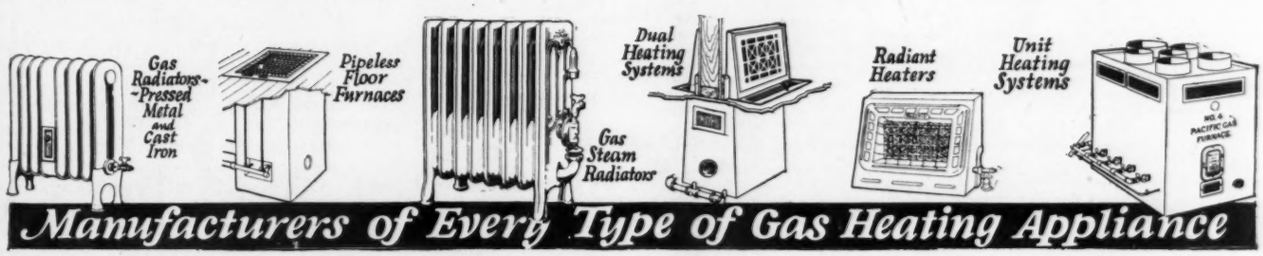
And they can also quickly show that each Pacific appliance has patented superiorities which make it more efficient than competing types.

If you'd like to sell a complete quality line, write for the Pacific agency proposition.

Pacific Gas Radiator

Gas Heating Company Headquarters

1732-1740 W. Washington Street LOS ANGELES Phone BEacon 2190



Manufacturers of Every Type of Gas Heating Appliance

THERE IS A

PABCO PRODUCT

TO PROTECT
EVERY SURFACE

PAINT ROOFING SHINGLES
FLOOR COVERING PIPE COVERING
WALL BOARD VARNISHES
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High Grade Machinery

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Hamilton compressors
Green fuel economizers
Wheeler Condenser & Engineering Co. condensing machinery
Cochrane feed water heaters (open and closed)
Cochrane feed water softeners (hot and cold processes)
Cochrane feed water metering heaters
Cochrane steam and oil separators
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Griscom-Russell Heaters, Evaporators, Distillers, Multi-Whirl Coolers
Moore automatic fuel oil regulators
Diamond soot blowers
Lagonda tube cleaners
Copes feed water regulators
Lagonda automatic boiler stop valves
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Vancouver, B. C., Standard Bank Bldg.

Formal Organization *of* Gasoline Association

(*Continued from Page* 22)

serve the association during the first six months will hold over during the coming year, as a result of the election of June 16. Paul D. Barton, former manager of the gas department of the United Oil Company but now an independent gas consulting engineer, heads the association as president, with J. A. Campbell of the Lomita Gasoline Company as vice-president, and J. S. Watson, gas engineer of the Shell Company as secretary.

An executive committee of nine is constitutionally in charge of the affairs of the association. R. E. Beckley, Pacific Gasoline Company; Geo. L. Radcliffe, General Petroleum Corporation; D. A. Cushman, California Petroleum Corporation; and I. B. Funk, Lovell Gasoline Company, were of the original executive committee and will continue in office. Two others, H. L. Eggleston of the Pan American Petroleum Company, and R. W. Garman of the Union Oil Company of California, were added to the committee, raising the number to the required nine, including the three officers.

Following the election, F. L. Kallam, gas engineer of the Mutual Gasoline Company, read a paper on "Fundamentals of Heat Exchanger Design," prepared by himself and A. F. Semino, gas engineer of the Shell Company of California. Mr. Warner's paper followed.

The chief import of Mr. Warner's paper, and the point which received emphasis in the general discussion following it, was that there is a woeful lack of standardization in testing practice in the California natural gasoline industry. In the charcoal test distilled at 30 pounds, now in common use by the major companies, it was stated that there are 16 distinct points where practice may vary with the person doing the testing, with a resultant variation of 15% to 50% in checking.

Standardization of testing practice is the avowed purpose of the association. A committee will probably be formed to study the individual tests now in use, and it is planned to discuss testing methods in future meetings of the membership. President Paul Barton sums up the situation this way: "The development of the natural gasoline industry is bound up in the development of its testing practice." With all of the major companies represented in the membership of the association, and with leaders in the consulting field also intensely interested in the work being done there is good reason to expect improvement in current testing methods.

A. F. BRIDGE VACATIONS IN MENDOCINO COUNTY

A. F. Bridge, executive engineer of the Southern Counties Gas Company, in charge of operations, accompanied by his family, left Los Angeles on June 19th for Mendocino County, where he spent his vacation.

CHANGES IN H. R. BASFORD ORGANIZATION

Recent report has it that H. R. Basford, president of the H. R. Basford Company of San Francisco, has announced his retirement from active management of the affairs of his company, effective July 1, which presumably means the elevation of George Eggleston to the general managership of the company. A. F. Rice, former general manager of the Western Stove Company, Culver City, California, has accepted the sales managership of the Basford company.

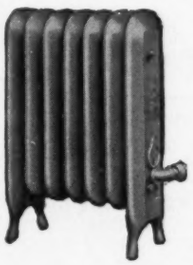
POTTER Heating

For many years POTTER Engineers have pioneered the way in the advancement of modern Gas Heating Systems. They have developed Gas Heating to such a degree of perfection that today, POTTER Products have become a standard of comparison wherever dependable, safe, economical and healthful gas heating is discussed.

OUR BEST ASSET

The tens of thousands of satisfied customers that our Organization has made through POTTER Gas Heating installations, is a JUST tribute to a satisfactory product—a gratification to conscientious effort.

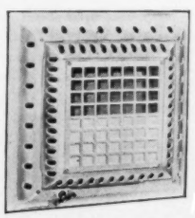
THERE ARE MANY REASONS WHY IT IS BETTER TO INSTALL POTTER SYSTEMS



"POTTER" Vented Radiators

Only POTTER has these 7 POTTER Features (Cast Iron and Steel-Made)

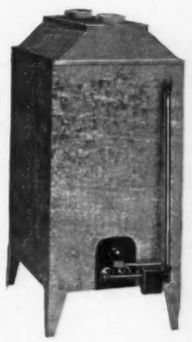
1. Condensation abolished. This does away with corrosion. Many years are added to the life of the Radiator.
2. Triple Circulation. The heat goes into the room, not up the flue.
3. Uniform warmth distribution. The air is never "cooked."
4. Quick heat. No other radiator heats so quickly as the light, efficient POTTER Steel-Made.
5. Aristocratic appearance. The POTTER Cast Iron Radiator is selected for the finest and largest homes.
6. Totally odorless always.
7. Not expensive.



"COLE" Floor and Wall Heaters

Made in heavy solid cast aluminum.

COLE is the only furnace manufactured that can be installed on either the first or second floor.



"MAGIC WAY" FURNACES

"MAGIC WAY" was the first, and has always been considered the leading Unit System of heating.

The principle of Unit Heating of modern buildings, brought to its present state of refinement through the study and efforts of this Organization, is based on the principle of an individual furnace or heater for each room or group of rooms to be heated.

This type of installation allows accurate temperature control in each room, regardless of the demand in other sections of the home.

POTTER quantity production now makes "MAGIC WAY" with electric controls, available to anyone who desires a gas furnace system.

The same features that make these well known POTTER-made appliances favorites with home builders and home owners, make them popular with churches, schools, theatres, auditoriums and factories.

The low cost of adequate heating by means of "MAGIC WAY" Vented Furnaces of either the Unit or Central Plant type, will be a revelation.

"MAGIC WAY" VALVES

By merely pressing a button, the temperature of any room may be regulated. This valve not only turns the heat on but it regulates the heat to suit your exact wants.

"MAGIC WAY" Floor Furnace

When the furnace type of heat is desired at low cost or when a basement is not available, use "Magic Way" Vented Floor Furnaces.

Potter Heating Includes:

"MAGIC WAY" UNIT FURNACES
"POTTER" GAS RADIATORS
"STEEL-MADE" GAS RADIATORS
"COLE" FLOOR AND WALL FURNACES

There Is a **POTTER System** for Every Need

POTTER RADIATOR CORPORATION

San Francisco—Oakland—Los Angeles—San Diego

Uniform Quality Assured

Welders who use **Commercial Acetylene** soon learn that every cylinder contains the same pure gas.

Commercial Acetylene
Means pure acetylene.

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Means prompt service.

Commercial Acetylene is supplied in the following size cylinders:

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Commercial Acetylene Supply Co., Inc.

417 Market St. San Francisco
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Warehouses in all important centers.

H. M. CRAWFORD INSPECTS A. G. A. LAB. ON EASTERN TRIP

H. M. Crawford, General Sales Manager of the Pacific Gas and Electric Company, has returned to San Francisco from a trip through the East and Middle West. Noteworthy among the visits he made during his tions at this plant were quite frank in saying tory of the American Gas Association at Cleveland.

Mr. Crawford's contact with those in charge of the laboratory has convinced him more than ever before of its worth as an institution for the general betterment of the gas industry. Officials in charge of operations at this plant were quite frank in saying that something of an apathetic attitude on the part of manufacturers has seriously handicapped the work of the certification of appliances.

An effective way to overcome this, however, was developed when the laboratory issued its first list of certified appliances, containing the names of only a few of the best known makes on the market. Many names that were not on this list were left off because their products had not been submitted for tests. Inasmuch as this automatically allowed them to remain in the same category with those who had been weighed and found wanting, they are now displaying a very active concern over the rating of their own equipment.

SHELL OIL CO. BUYS ABSORBERS FOR VENEZUELA

According to the announcement of J. A. Campbell of Long Beach, Calif., the Shell Oil Company has bought five Campbell Oil Froth absorbers for installation in Venezuela. This company has 24 absorbers in operation and 21 undergoing completion.

STEAM TURBINE INSTALLED AT PORTLAND PLANT

The Portland Gas & Coke Company has recently completed the installation of a 1000 gal. per minute steam turbine driven pump and three Cochran Cone type water filters. This equipment will furnish water from the Willamette River for boiler feed water and cooling water for the waste heat valves at the gas generators.

COOPER ENGINE INSTALLED ON SO. COUNTIES VENICE LINES

A C. & G. Cooper Co. engine has been installed on the Southern Counties Gas Company lines at Venice, Calif., to replace a steam driven engine. The new engine will operate on as low as 600 B.t.u.

SHELL COMPANY TO HAVE NEW VENTURA ABSORPTION PLANT

The Shell Company of California, one of the three major operating companies in the Ventura field, is beginning construction of a 60,000,000 cu. ft. daily capacity gasoline absorption plant, to supplant its present equipment handling 30,000,000 cu. ft. daily, say field reports. Grading operations are already under way.

ROPER-BABCOCK FURNACE TO BE EXHIBITED IN TOKIO

M. Nagoi, sales engineer of the Tokio Gas Company, after an extended trip to the various manufacturing centers of the United States, where he investigated the merits of many types of gas furnaces, has selected a Roper-Babcock High Efficiency Gas Fired Warm Air Furnace to take back with him to Japan where it will be set up on the floor of the Tokio Gas Company as a working display. Mr. Nagoi has been in this country since last March.

P. G. & E. LABORATORY MOVED TO EMERYVILLE

The old gas laboratory of the P. G. & E. that has for a number of years been on Stevenson street, San Francisco, is being closed and the activities that have centered here are being transferred to the new industrial gas laboratory in Emeryville. The new laboratory, which is more elaborate than the old one that it supplants, will carry on the same kind of research work, but on a much more extensive scale.

The work will fall into two general divisions: first, laboratory tests, development and research work on gas fired equipment for all industrial uses, and second, field work on industrial installations, which will include the gathering of detailed data on plants already in operation, for the use of the sales department.

F. A. Archer remains in charge of this important phase of the company's activities.

CITY MANAGER SAYS UTILITY DEPARTMENT IS LOSING

Charles S. Henderson, city manager for Long Beach, Calif., is quoted in the Long Beach Press-Telegram of June 19 as saying that the city has been "kidding itself" into the belief that its gas and water repartment is showing a profit. Certain charges, the item quoted Mr. Henderson as saying, should be made of these departments which were not being made, and the examples of office rent, purchasing, and legal services were given. "Fifty-cent gas is not fifty-cent gas when the taxpayers are paying for the maintenance of the department," Mr. Henderson is quoted as saying, the paper's implication being that an adjustment of utility rates in Long Beach will soon be faced by the city.

U. C. L. A. GRADUATES INSPECT SO. CAL. PURCHASING DEPT.

N. L. Morse, purchasing agent for the Southern California Gas Company, recently conducted a number of the graduating class of the University of California, Southern Branch, through the company's central plant. the group being entertained at lunch at the company cafeteria. Prior to the inspection tour Mr. Morse had delivered a lecture on the "Ethics of Purchasing" to university classes in Purchasing.

NEW ABSORPTION MEDIUM IS SUBJECT OF EXPERIMENT

The Standard Oil Company of Indiana has become interested in a new absorbing medium for the extraction of gasoline from natural gas discovered by Dr. Edouard Urbain, a French chemist. Preparations are under way, under the direction of Dr. J. G. Dely, to install an experimental plant. The Urbain Corporation, with headquarters in New York City, will handle the process and the Urbain Gasoline Company will handle the extraction of gasoline from natural gas in the oil regions.

PORTLAND BRIQUETTING PLANT UNDERGOES OVERHAULING

The briquetting plant of the Portland Gas & Coke Company has been given a thorough overhauling and is ready for top speed production in anticipation of the coming season's demand for Gasco Carbon Briquets.

PUBLIC SERVICE DITCHER SERVES P. G. & E. AT STOCKTON

A Model 20 Public Service Ditcher, manufactured by The Parsons Company, Newton, Iowa, has been delivered to the Stockton division of the Pacific Gas and Electric Company.

Convention time

is the time when plans for new equipment are considered and *talked about* for the coming year

Two Special Issues of
WESTERN GAS

The August issue will be our "Pre-Convention Number." In addition to the regular editorial contents it will contain abstracts of all the papers which are to be presented on the floor of the convention.

The September issue will be our "Post-Convention Number." It will be preserved by all members for reference during the year because its contents will include the discussion of the papers presented at the convention.

MORE than 500 leading gas men of the West will be talking shop together at Pasadena. Claude Webber of Tucson will give us the latest on his new generators—Harry Smith of San Francisco will tell of the new Marysville plant—We will hear about the new automatic control board from Harritt of San Diego—Bill Moeller of Los Angeles will explain the building of his new pipe-line and compressor station—Willis Yard of San Francisco and Fred Schafer of Los Angeles will have lots of "info" on their new holders—George Wehrle of Denver will tell us how he put gas into Fort Collins—Clarence Cope from Panama will be asked about his company's recent large purchase of gas ranges. For five days the Pasadena climate will be "blended" with a lot of this sort of "shop-talk," which, of course, is not on the convention program.

Get Your Products Talked About

The advertising pages of these two convention issues of WESTERN GAS offer the best means of "getting your products talked about," and of presenting a claim for a share in this business. The manufacturer, to get full benefit from his advertising, should order his convention advertising to appear in both the August and September issues of WESTERN GAS.

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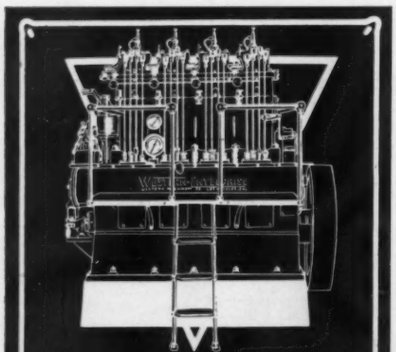

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Always dependable, utmost efficiency and economy, (often setting new high records), gas engine simplicity, negligible overhead expense, low grade fuel oil, and minimum attention without high priced engineers.

Built in single and multiple cylinder units from 30 to 400 H.P. Write for catalog No. 510.

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LOS ANGELES, CALIFORNIA
San Francisco Offices & Factory
18th and Alabama Streets

A typical, gas company cooking school session in one of the suburbs of Portland, Ore.

Bringing *the* Cook *back to the* Home

By JOHN H. HARTOG
Sales Manager, Portland Gas and Coke Company

THE tendency of the present day to do less cooking in the home is one of serious importance to the gas industry. How to meet the situation is a problem.

After considerable thought, the Portland Gas & Coke Company decided that the only thing to do was to get women more interested in good cooking and secondly, to try and have them possess high-grade gas ranges, instead of cheap, obsolete ones.

Both efforts have been successful in Portland, but they cost a lot of money.

Having decided upon the object to be gained and the method, cooking classes were given in the lower salesroom of the gas company, but at the most the attendance did not or could not exceed 200, and generally did not run over 100.

Taking Schools to the Women

It was then decided to take the cooking school to the women, if the women would not come to the school, and arrangements were made with the newspapers in the various suburbs, outlying communities or towns, to sponsor the cooking school for their particular locality as a favor to their readers.

Last year a few such shcools were held and invariably met with success and appreciation. It was quite noticeable that invariably the first class would be skeptical and distant, feeling quite sure there must be some catch. When they learned that the gas company did not try to sell anything and was evidently giving the women all this enjoyment and instruction in order to be of service to them, they became as enthusiastic and appreciative as they had been suspicious at the outset.

This year 15 cooking schools were conducted. The schools were given two afternoons a week for two weeks. These four lessons are just about right for the amount of information and demonstration furnished. A shorter time would hardly suffice; a longer time might result in losing the interest..

As the newspaper is particularly interested in making its readers appreciate its efforts, the publisher naturally will devote considerable front-page publicity to the cooking school of his particular paper.

The food of course is supplied by the gas company, and samples are generally served. Food for the four demonstrations in the average school costs about $55.00.

A demonstrator who can talk and cook at the same time is essential. She has to have an assistant to serve and help and in addition to this it takes the time of one man and perhaps two to arrange the details, that there are enough chairs, etc. This year the schools have been a tremendous success and invariably we have "Played to Standing Room Only."

Last year the gas company mimeographed some of the recipes which the women liked, as it is impossible to have them take notes that are accurate, because the information comes faster than they can write it. This year special programs were supplied showing the modern Smoothtop gas range in three color print and the recipes for the various things demonstrated or prepared during the four days.

A Contest in Portland

In order to wind up this effort in a blaze of glory, arrangements were made with one of the Portland papers to put on a big cooking school of its own, for which purpose the Elks ballroom was engaged by the gas company and attractive prizes offered for the contests, to see who could make the best cake, pie or cookies. After considerable investigation it was decided to omit the bread contest.

The newspaper naturally gave its cooking school front page publicity, got the different women's organizations interested, created some rivalry, got the various food

producers or dealers to advertise their wares and display them at the classes, as well as furnish door prizes. All in all, at present writing (June 18), the stage has been set for one of the most attractive and best advertised cooking schools ever put on in the city of Portland.

All these 16 efforts "run into money" and will cost several thousands of dollars, but are worth every cent invested. It is too early as yet to know just how many women have been interested in better cooking and the use of the modern Smoothtop gas range, as well as sold to the courtesy and unselfish spirit of the Portland Gas & Coke Company. Roughly estimating, however, it appears that we probably have reached between two and three thousand women, besides the expected thousand women at the newspaper cooking school the latter part of June.

While the tendency to eat out of a sack, go camping or picnicking or to eat at hotels and eating-places along the road is becoming more and more pronounced day by day, it is interesting to know that the consumption of gas for residential purposes per capita has not decreased. On the contrary, it shows some increase and this in face of the fact that a year or two ago it was decreasing.

The other part of the campaign to meet the situation is to see that women do not have undesirable cook-stoves but the very latest and then are shown how to use them. This, however, is a separate subject although very closely allied with the cooking school efforts.

Selling Gas *to* Engineers *for a* Boiler Fuel

(Continued from Page 21)

This steam pipe entails investment, possibility of leaks, maintenance and insulation, loss by radiation and a direct increase in cost of burning. Gas requires only one pipe and has none of the drawbacks of the fuel oil.

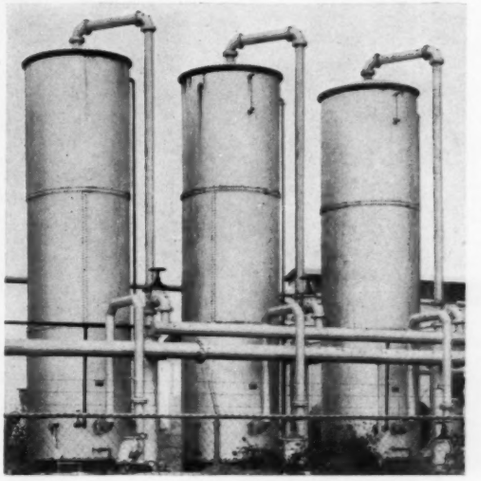
Automatic regulation on oil is difficult to obtain and good burning conditions are not maintained because the hole in the regulator that is required to pass the oil is so small that the slightest change caused by the regulator means a decided change in the fire box conditions. At the present time there is hardly an automatic oil regulator made which will give good burning conditions on all loads. The characteristic of difficult automatic regulation is one of the inherent disadvantages of fuel oil. Automatic regulation of gas no longer is a problem, because we have the spring diaphragm type of regulator like the Wilgus and Mason and the diaphram lever type like the Chapman Fulton. We have the damper control and balanced valve like the Mason and Jules d'Este. In Los Angeles there is a gas fired plant that instead of having a regular steam gauge, has a big dial showing only one pound of steam and a Wilgus pilot operated automatic steam pressure regulator holds the pressure within this one pound variation on a fluctuating load day after day. Going on through the minute operation of burning these two fuels, there is not an instance where gas has not the advantage over fuel oil from the standpoint of easy operation.

4. *Auxiliary equipment.* Fuel oil requires storage tanks of sufficient capacity to handle at least the daily operating requirements, also duplicate pumps are usually installed and steam lines are necessary for oil burning equipment except in the case of mechanical oil burners and in that type leaks must be carefully watched, on account of the high pressure carried on the oil. None of these features are encountered in the use of gas.

Speaking of Repeat Orders

One well-known California oil company started with three Campbell Oil-Froth Absorbers. This company now has twenty-four in service and seventeen more in our shops in process of manufacture.

Campbell Absorbers have given satisfactory service to every company which has used them. They pay for themselves very quickly out of the increased production.



Write for catalog.

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CAMPBELL
OIL FROTH
absorber

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NATURAL GAS ENGINEERS

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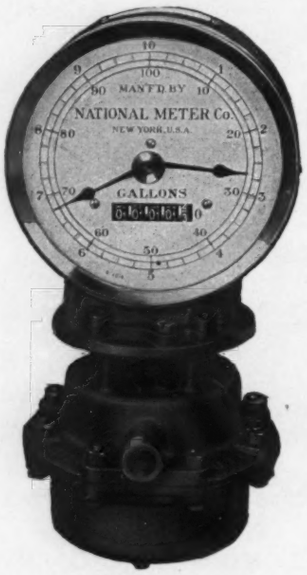
OIL METERS



The EMPIRE

Positive displacement, oscillating piston design.

Different from every other type of meter.

Unsurpassed in over forty years for accuracy, durability, and low cost of upkeep.

Used with highest satisfaction by

Gas Companies

in every section of the country.

Made in all sizes, 5/8 in. to 6 in., inclusive.

EMPIRE Oscillating Piston Oil Meters are fully described and illustrated in Circular 110-W. Send postal for your copy.

National Meter Company

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Chicago Boston Atlanta
San Francisco Cincinnati
Los Angeles

5. *The products of combustion must not be objectionable and good combustion must be easily obtained under all load conditions.* The products of combustion when either fuel is properly burned are not objectionable. But the second requirement is the crux in the entire comparison. Good burning conditions must be easily obtained under all load conditions. Everyone knows that oil does not lend itself readily to low load conditions or high over-loads without smoking. Smoke is a nuisance because it soils clothes and smudges fabrics that come in contact with it. For the department store it means a direct loss and for office buildings and hotels it necessitates the cleaning of the interior and exterior of the building and a decided increase in the laundry bill which must be marked up against the oil. Almost everybody has seen the black smoke pouring out of the stacks in our downtown district. The savings derived by elimination of this one bad feature would make gas a good investment. There are several downtown gas fired boilers developing from 200 to over 300% of rating without a trace of smoke.

Of course, you can make gas smoke, but it is far easier to burn it without smoking than it is fuel oil. Smoke and soot are annoying, but where the biggest expense occurs is that a smoking boiler is not being operated efficiently and furthermore all the soot does not go out of the stack. It is a question whether to be thankful or sorry for this. However, some of the soot that remains in the boiler stays on the tubes and it is a very nice heat insulator until it is removed. So a higher fire and higher stack temperature must be carried until the tubes are cleaned and this means a decrease in efficiency.

6. *The use of fuel must not be detrimental to the boiler or refractories.* There are boilers where an extra course of bricks were placed in the setting so that the slagging caused by the impingment of the fan-shaped oil fire would not weaken the setting. This is not true of all fire boxes, for many boilers are not carried at more than rating. Also the sulphur contained in the oil will combine with the steel and shorten the life of the boiler. The Ford Motor Company has run some extensive tests on the effect of oil and gas on refractories and has found that gas is by far the easier on brick work. In many cases where hard firing conditions existed and when gas was used the refractories lasted much longer than when the same load was carried on fuel oil. This is undoubtedly due to the ready mixing of gas and air in a properly designed furnace. The flame is so short that the furnace is heated by the hot gases and for this reason heats up more uniformly than when oil is burned. With an even heat all through the furnace the boiler operates better because the radiant heat affects the tubes or shell equally and no hot spots or excessive strains are set up in the boiler.

7. *It must not cost more than any other fuel that is as good and can be obtained.* There isn't a gas fired boiler in Los Angeles on an industrial rate which costs more to fire than it would with oil, and that comparison only takes in fuel cost, cost of atomization and maintenance, labor saving and cleanliness. Due to the convenience and cleanliness alone gas should be used even if it costs the same as oil. Many old customers say: "Why if gas cost 10 per cent more than oil I would use it."

It has been said by eminent authorities that there is no such thing as an oil burner and equipment bearing that name should be rechristened "oil atomizer" because it serves a purely mechanical purpose, namely that of atomization. Fuel oil does not burn as a liquid. That is the reason for trying to atomize oil so that each little particle will vaporize and burn. It is the oil vapor which burns because the flash point is far above the vaporization point. Most all fuel oils contain residues which do not vaporize. If these sooty residues during the process of combustion come in contact with comparatively cool spots, they stick to them, forming a coke deposit which must be removed if continuous operation or efficiency is expected.

Gas, since it is already a vapor, combines readily with air and burns with a shorter flame than oil. Therefore complete combustion has taken place before the products of combustion come in contact with cool surfaces. From what has been said it is obvious that gas is a cheaper fuel than oil. The direct B. t. u. comparison is not a true one because this comparison considers both fuels as being burned 100 per cent efficiently and the oil is not burned as efficiently as the gas in actual operation.

Gas Burners

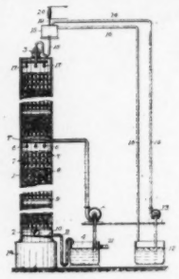
This hastily covers the comparison of the two fuels. Now as to gas burners. Burners are made up of three types. There is the high pressure burner which operates on from 1½ pounds to about 5 pounds and induces its own air. Then there is the low pressure burner which operates on a few inches of water pressure to about 1½ pounds and induces its own air. Next there is the combination burner that burns gas or oil. These are usually low pressure gas burners and high pressure mechanical oil burners and always cost much more than either the high or low pressure gas burners, but they are worth it. Speaking of just a gas burner and to answer the question: "What burner shall I use?", it is true that any burner that does not require a checker or baffle wall and has good distribution of fire and produces a good CO_2 reading is the one to use. The high pressure burners are inherently more noisy than low pressure, but they will show just as good economy as can be obtained with a low pressure burner.

Just a few words on why gas should be burned and why it is necessarily cheaper than oil. It is unquestioned that gas, when obtainable at an equivalent cost, is the ideal boiler fuel; this fact has been stated by many eminent engineers. It is easy to handle and regulate, produces no smoke and reduces boiler maintenance.

As to comparative costs, probably a great many people figure this way: "There must be some drawback to gas or the oil companies would lower their price to beat out gas and retain this business they are losing. And since the oil companies do not make a move to hold this business there is a nigger in the woodpile and I am not going to bite." Well, there is a reason and a good one, too, why gas is cheaper than oil. Gas comes out of the same hole that produces oil and after the gasoline has been removed the oil company has on its hands a wonderful fuel that requires pipe lines and compressors to get it to the point of consumption. Usually the gas which the oil companies have available is so far from the consumer that it is not practical for the individual companies to transport gas to the market. So instead, they sell the gas to a gas company. This immediately, through their own action, puts on the market a competitive fuel; but the competition is only local, so they feel that the ratio of their oil market to the gas market gives them a decided advantage.

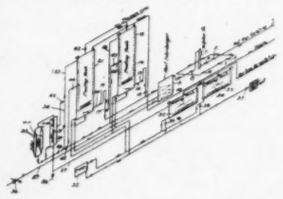
THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,578,687. PROCESS FOR THE REMOVAL OF NAPHTHALENE AND ANALOGOUS HYDROCARBONS FROM FUEL GASES. FREDERICK W. SPERR, Jr., Pittsburgh, Pa., assignor to The Koppers Company, Pittsburgh, Pa., a Corporation of Pennsylvania. Filed Jan. 26, 1925. Serial No. 4,086. 19 Claims. (Cl. 183—114.6.)



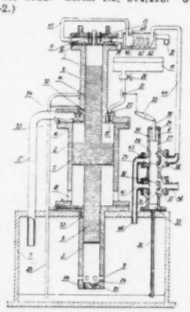
1 The process of removing naphthalene from flowing fuel gas, which includes recirculating a solvent through the flowing gas, and subjecting the same gas to substantially uncontaminated solvent after it has passed through the re-circulating stage, substantially as described.

1,574,507. PROCESS AND APPARATUS FOR THE CONTINUOUS TREATMENT OF NATURAL-GAS GASOLINES. GEORGE GROVER OBERFELL, ALBERT M. BALLARD, RICHARD C. ALDEN, EDWARD L. UTSINGER, and WILLIAM R. LENTZ, Tulsa, Okla., assignors to Chestnut and Smith Corporation, Tulsa, Okla., a Corporation of Oklahoma. Filed Apr. 22, 1921. Serial No. 463,589. 9 Claims. (Cl. 196—24.)



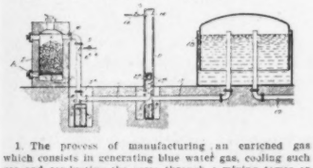
1. The process of treating natural gas gasoline which consists in dissolving therein a quantity of elementary sulphur, and then passing the gasoline through a solution of sodium hydroxide without distilling the gasoline.

1,571,615. METHOD AND APPARATUS FOR COMPRESSING GAS. JULES BABIN, Paris, France. Filed July 12, 1922. Serial No. 574,413. 6 Claims. (Cl. 123—2.)



1. A method for compressing gases by means of a free flying piston travelling in a cylinder consisting in introducing a charge of a compressed explosible mixture into the cylinder, igniting said charge when the piston has travelled over a part of its stroke, utilizing the working of the piston produced by the introduction of the said charge and by the explosion to reduce the volume of a supply of compressed gas whose pressure is kept constant, using the same working of the piston for the suction of a given charge of the gas to be compressed, using the expansion of the said supply of compressed gas for producing the working of the piston in an opposite direction, using the said opposite working of the piston for compressing and then forcing at a constant pressure, the charge of gas to be compressed, using said opposite working of the piston for expelling the exhaust gases, and equalizing the quantity of motive power produced by the expansion of the compressed gas and the quantity of resisting power invested in the compression of the gas and its forcing at a constant pressure, so that the free flying piston will reach its starting point with a speed equal to zero.

1,573,524. GASEOUS FUEL PRODUCTION. JAMES R. ROSE, Edgeworth, Pa., assignor of one-half to John Harris, Cleveland, Ohio. Filed May 28, 1923. Serial No. 641,883. 5 Claims. (Cl. 48—295.)

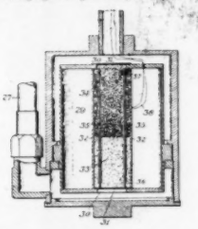


1. The process of manufacturing an enriched gas which consists in generating blue water gas, cooling such gas and conducting the same through a mixing tower or chamber, and adding to such gas while in transit through said mixing chamber or tower a regulated quantity of liquefied hydrocarbon gas having a vapor tension of not less than twenty-five pounds per square inch and not greater than five hundred pounds per square inch at atmospheric pressure and ordinary temperatures.

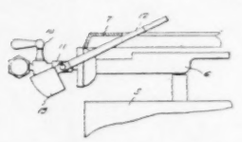
1,578,666. METHOD AND APPARATUS FOR QUANTITATIVE DETERMINATION OF GASES. SIDNEY H. KATZ, Pittsburgh, Pa. Filed Mar. 12, 1925. Serial No. 14,915. 40 Claims. (Cl. 23—232.)

9. The method of quantitative determination of carbon monoxide, which includes subjecting the gas to the action of a filter, passing the gas over hopcalite and measuring the temperature in crease, the filter being adapted to remove suspensoids tending to poison the hopcalite.

38. Apparatus for the quantitative determination of gases, including gas supply means, a drier, a purifier, a constant temperature chamber containing preheating means for bringing the gas being analyzed up to substantially the temperature of the chamber, a catalytic cell within the chamber having a catalyst therein, and electrical temperature measuring means for measuring the evolved heat.



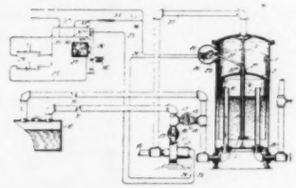
1,571,881. AUTOMATIC FUEL CUT-OFF FOR GAS STOVES. JOHN ZIMMER, Troy, N. Y. Filed Nov. 8, 1924. Serial No. 748,712. 1 Claim. (Cl. 126—52.)



In a stove of the character described, a burner element, a utensil support having an opening above the burner, a fuel supply pipe leading to the burner element, a valve in said pipe and having a rockable control member the axis of which is horizontal, and a one piece lever fixed at an intermediate point of its length with respect to the said rockable control member of the valve and extending at right angles thereto and having an arm extending through the opening in the utensil support and normally extending to a point in a plane spaced above the upper side of the utensil support and also having an integral weight on its outer arm, the first-named arm of the lever and the utensil support being so relatively arranged that the bringing up of the lever against said support stops the rockable control member in closed position.

1,574,502. OIL-GAS-MAKING APPARATUS. CHARLES MATTHEWS, Jr., and WILLIAM C. MATTHEWS, Chicago, Ill. Filed Mar. 17, 1923. Serial No. 625,709. 10 Claims. (Cl. 48—144.)

4. In an oil gas making apparatus, the combination of a closed casing, a holder movable in said casing, a gas generator in communication with said holder, means for forcing air into said generator and holder, an air inlet for said air forcing means, and a pipe connecting the interior of said casing with said air inlet.



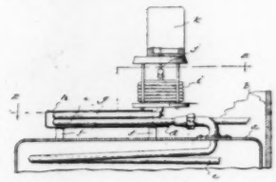
1,547,974. VALVE FOR GASES. JOSIAH C. THAW, Pittsburgh, Pa. Filed Nov. 24, 1923. Serial No. 676,808. 3 Claims. (Cl. 98—27.)

1. A valve comprising an inclined seat member having an outlet opening extending therethrough and a flexible closure element secured to the seat member above the outlet opening and normally resting against said seat member gravitationally to close the outlet opening, said closure element being capable of flexing away from said seat at its point of securement thereto upon the exertion of pressure thereagainst in one direction, and means adjacent said point of securement presenting a curved surface against which said closure element flexes, whereby to prevent cracking or deterioration by bending of said element at a sharp angle.

1,573,509. PROCESS OF PRODUCING HIGHLY-ADSORBENT CHARCOAL. ERNEST BATEMAN, Madison, Wis., assignor to the United States of America. Filed Aug. 5, 1919. Serial No. 316,498. 3 Claims. (Cl. 252—3.)

1. In a process of activating carbon, treating carbon in comminuated form and while in a free condition with carbon dioxide at temperatures of 650-1000° C.

1,572,467. REFRIGERATING APPARATUS. LOUIS G. BURGESS and HARRY THOMPSON, Detroit, Mich. Filed Nov. 22, 1923. Serial No. 676,227. 2 Claims. (Cl. 62—4.)

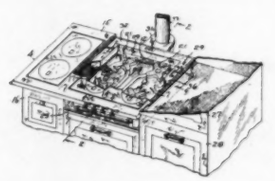


2. In a refrigerating control, the combination of a conduit bearing the expanded gases of a refrigerating apparatus and forming a loop, a fluid expansion type of thermostat provided with a feeler leg in the form of a loop lying against the loop of said conduit, and a shield encasing the two said loops for holding the parts in heat conductive relation.

1,572,661. GAS STOVE. WALTER C. LINDEMANN, Milwaukee, Wis. Filed Feb. 17, 1923. Serial No. 9,749. 15 Claims. (Cl. 126—39.)

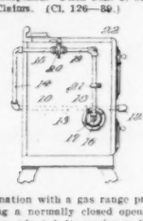
1. In a gas stove, a cooking top provided with cooking holes adapted to be closed, means for closing the same, a bottom member beneath said top and spaced therefrom, a stove frame comprising back and side members forming with said top and bottom a substantially unobstructed burner box and heat generating and distributing chamber extending from front to back of the stove, said box being open at its front, a burner located in the forward part of said space intermediate said top and bottom and in proximity to and below the top of the said open front, and having its top in free communication with said space and with the said top vertically and laterally, said open front admitting air directly to the top of and below said burner.

1,574,079. AIR FEED AND VENT FOR CLOSED-TOP GAS STOVES. JOSEPH B. GARDNER, Oakland, Calif., assignor to Hammer-Bray Company, Oakland, Calif., a Corporation of California. Filed May 11, 1925. Serial No. 29,365. 9 Claims. (Cl. 126—39.)



1 In a stove provided with a closed top gas-burner chamber, front and rear top gas-burners in said chamber, means at the front and rear of said chambers, through which fresh air may be introduced into the chamber, and means through which the burned gases from said chamber may be discharged therefrom intermediate the front and rear of the chamber.

1,574,655. GAS RANGE. HARRY W. HUNTER, Baltimore, Md., assignor, by mesne assignments, to Union Trust Company of Maryland, trustee, Baltimore, Md., a Corporation of Maryland. Filed Jan. 5, 1922. Serial No. 527,141. 4 Claims. (Cl. 126—39.)

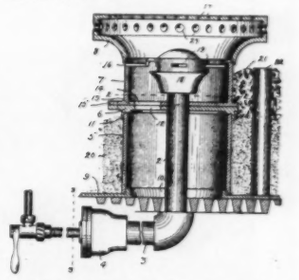


1. The combination with a gas range provided with an oven and having a normally closed opening in one end wall of the oven adapted to receive a thermostatic device, of a gas manifold terminating in a short branch overlapping said oven end wall, a burner extending into the oven through said end wall, and a removable conduit member consisting of two angularly disposed portions lying in a plane parallel with said end wall, one of said portions being connected to the burner and the other with said manifold branch, and a joint between the portions of said conduit member located opposite said opening, whereby a similar conduit member having a thermostatic device located at said joint and extending into the oven may be readily substituted for the first mentioned conduit member.

1,571,624. PURIFICATION OF GAS. JOHN WILLIAM COBB and HENRY JAMES HODSMAN, Leeds, England. Filed Jan. 5, 1925. Serial No. 658. 1 Claim. (Cl. 23—3.)

The improved process of purifying fuel gases which comprises subjecting the fuel gases to the action of contact materials, adapted to secure the partial oxidation of the hydrogen sulphide under conditions of temperature and humidity which will ensure that the free sulphur formed shall be carried forward from the contact material and that the latter maintains its activity and utilizing ammonia to enable the removal of sulphur dioxide present in the gas after partial oxidation of the hydrogen sulphide to be effected by condensation and washing operations, the ammonia content of the fuel gases being adjusted to ensure that under the conditions in which the treatment with the contact material and the further treatment of the gas is carried out, the acidic oxygen containing sulphur compounds may be effectively removed.

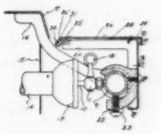
1,574,068. GAS BURNER. WILLIAM D. CRITES, Duluth, Minn. Filed July 18, 1924. Serial No. 726,738. 3 Claims. (Cl. 158—99.)



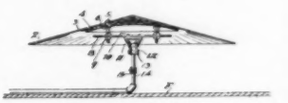
1. A gas burner of the type described comprising an upright three-part rotatably adjustable cylinder having an axial gas burner therein, portions of said cylinder being adjustable about the burner as an axis to regulate the air passing through the cylinder to the burner, the upper portion of said cylinder being outwardly flared and provided with discharge ports, some of said ports occurring below the flared portion and some above the flared portion.

1,574,002. GAS-COCK SHIELD. SAMUEL ROLLAND, Flint, Mich. Filed May 2, 1925. Serial No. 27,496. 5 Claims. (Cl. 126—42.)

1. A gas cock shield of the class described, comprising a vertically extending supporting plate having a vertically extending and a horizontally projecting flange at opposite ends; a supporting member for mounting said plate on the feed pipe of a gas stove; and a cover plate, adapted, when in inoperative position, to extend parallel to and in close relation with said supporting plate and when in operative position, for extending horizontally in close engagement with said horizontally projecting flanges; and means for mounting said cover plate on said flanges for permitting the swinging of said cover plate into operative or inoperative position.

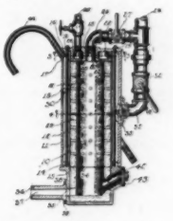


1,573,718. GAS BROODER. FRANK R. KIMBLE, Van Nuys, Calif. Filed Aug. 24, 1925. Serial No. 52,067. 5 Claims. (Cl. 119—32.)



1. A chicken brooder including a hood, a crown spaced under the center of the hood, and a burner on which the crown is supported and from which gas for combustion is delivered up against the crown.

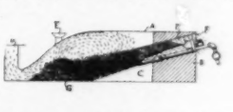
1,573,472. BURNER. ALBERT ZANDER, Chicago, Ill. Filed Dec. 13, 1923. Serial No. 680,458. 4 Claims. (Cl. 158—99.)

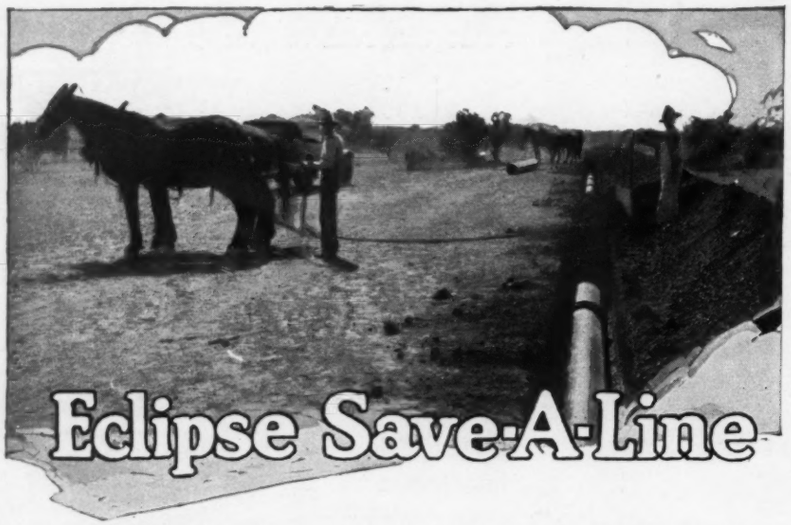


1. A gas burner for drying molds or the like, comprising a hollow body affording a combustion chamber into which the fuel is introduced, means for supplying a combustion-supporting material for supporting initial combustion of said fuel, a discharge outlet for the products of combustion, and controlled means for supplying a final combustion-supporting and temperature-reducing medium under pressure at varying points between the point of initial combustion and the discharge outlet.

1,571,179. METHOD OF AND APPARATUS FOR CONTROLLING AND DIRECTING BURNING FUEL OR GASES. HANNY ADAMS, Plainfield, N. J. Filed Jan. 28, 1923. Serial No. 614,419. 22 Claims. (Cl. 263—48.)

1. In apparatus for controlling and directing burning fuel or gases, means for projecting burning fuel or gases, and means for projecting substantially in the line of projection of the burning fuel or gases steam or air of greater velocity than the velocity of the burning fuel or gases for drawing along therewith the burning fuel or gases for controlling the same and after control thereof directing the burning fuel or gases for disposition of the heat thereof.





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PUEBLO, COLO., TO SHARE IN PANHANDLE GAS PROJECT

Advices from Pueblo, Colo., are to the effect that that community will share in the benefits of the proposed Denver-Panhandle natural gas pipe line, if plans for its construction materialize. The Pueblo Gas and Fuel Company, of which W. B. Kopfer is manager, is controlled by the H. L. Doherty interests.

A. E. FITKIN PAYS VISIT TO CALIFORNIA

A. E. Fitkin, president of the National Public Service Corporation of New York City, which controls a number of eastern utilities, was a visitor in Los Angeles during the latter part of June. In interviews given out during his stay he stressed the importance of public relations activity in utility operation.

H. B. WELLS HEADS L. A. G. & E. EMPLOYEE ASSOCIATION

As a result of the June 8 elections held for officerships in the Los Angeles Gas and Electric Corporation's Employees' Association, H. B. Wells will serve as president, William Maddock as vice-president, and R. R. Lloyd as treasurer. Directors-at-large are W. W. Taylor, G. S. Campbell, C. W. Reese and W. H. O'Connor. Divisional directors are: J. P. Hartshorn, H. W. Hemenway, A. R. Bailey, G. A. Riley, F. G. Sharp, F. R. Knight, and W. W. Edmonds.

ROSECRANS FIELD HAS LARGE GASSER IN BARNSDALL NO. 7

The largest gasser in the Rosecrans Field, Southern California, is the Barnsdall Oil Company's Rosecrans No. 7. This well has been holding up to a flow of 4,000,000 cu. ft. a day, according to field reports.

SPRAGUE METER CO. OPENS WAREHOUSE AT HOUSTON

The Sprague Meter Co. announces the opening of a new branch warehouse at Houston, Texas, where a complete line of Standard Meters is in stock. This new warehouse in conjunction with the warehouse at Davenport, Iowa, assures prompt service to the Mid-Continent territory.

W. L. HOYT REPRESENTING AMER. GAS PRODUCTS CORP. IN WEST

W. L. Hoyt has recently located in San Francisco as western representative of the American Gas Products Corporation, a distributing unit for the American Radiator Company. Mr. Hoyt's activities will consist chiefly in selling Ideal gas fired boilers for heating installations.

J. D. CLARK TO SUCCEED DYNES AS MIDWEST PRESIDENT

J. D. Clark, vice-president of the Midwest Refining Company, has been elected president to succeed Thomas A. Dynes, who becomes chairman of the board. Mr. Clark will resign as vice-president and assistant to the chairman of the board of the Standard Oil Company of Indiana, but will remain a director.

W. H. MIXTER USES VACATION TO GOOD ADVANTAGE

W. H. Mixter, capable assistant secretary of the Gas Appliance Society, on June 14th last, the first day of his two weeks vacation period, emulated the example of his equally gifted superior, Forrest U. Naylor, Secretary of the Society and manager of gas sales for the P. G. & E.

For on June 14th Mr. Mixter bestowed his name upon the lady of his choice. Mr. Naylor's nuptials were celebrated in February.

BURROUGHS MACHINES ADDED TO P. G. & C. CO. OFFICE

The Portland Gas & Coke Company this month completed the installation of seven new type Burroughs combination bookkeeping and billing machines. These machines make all entries to the ledger and bill at the same time at one operation. Five different items, such as cubic feet, dollars, dates, and codes are placed upon the keyboard manually and the machine prints 16 items, 11 being done automatically. These seven combination machines replace 11 machines of the old type. Combining the two operations makes possible the saving of the four operators.

NEW GENERATOR BUILDING IS UNDER WAY IN PORTLAND

The Portland Gas & Coke Company, as a part of its 1926 expansion program, is installing the foundation for a new generator building and four generators of five and a half million cubic feet capacity each. The foundations consist of 266 Raymond Concrete piles of an average length of 47 feet, supporting a reinforced slab of approximately three feet thickness. There will be 614 cu. yds. of concrete work and 70,500 lbs. of reinforcing. The work will cost approximately $63,000.00 and will be the first unit of a building estimated to cost $175,000.00, completion of which will be made during 1927.

The structure is so designed and placed that it may be extended to house 12 generators, each of five million cubic feet capacity. The design is of the monumental type with bushhammered walls and pilasters. The roof will be reinforced concrete slab on structural steel with an asbestos shingle covering.

Operation of Extraction Plants on High Pressure

(Continued from Page 27)

gallon of gasoline produced. Even if this gas is valued at the full retail price of 68c per thousand feet, the 40 cubic feet are worth only 2.72c. The gallon of gasoline is worth 16 to 17 cents at the present market, or about six times the value of the gas. Actually, of course, the value of the gas in the main pipe line is considerably less than the figure given, because the costs of retail distribution, metering, etc., have not been added to it.

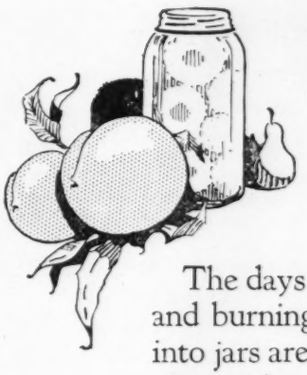
Effect on Heating Value

The question has been raised as to whether the operation of a gasoline stripper plant reduces the heating value of the gas put through it. Duplicate determinations recently made by the writer on the inlet and outlet gas of an exceptionally efficient stripped plant showed an apparent slight increase in the heating value of the gas after its passage through the plant. This was undoubtedly due to the unavoidable error of the calorimeter. The extraction of the gasoline vapor should show a slight decrease in the heating value of the gas, but the amount is evidently so small that it cannot be detected by commercial methods of testing.

Hazards of the Business

In general, the operation of a stripper plant is highly hazardous from the business standpoint. The success or failure of the plant is absolutely dependent upon the supply of gas passing through the line on which it operates, and the plant operator has no control over or influence upon this supply. In the case of plants treating gas direct from the wells it is often possible for an operator to augment his gas supply by careful conservation of all the gas available from the casingheads, traps, tanks, etc., and by following an aggressive policy in securing new wells as the field develops. None of these resources is open to the stripper plant operator. He is obliged to take what he gets and be thankful. Even though the original sources in the field hold up well, the flow in the line may decline or stop due to development of new sources of gas nearer the market which the line supplies.

On the other hand, of course, the gas treated may have original sources in several fields and from a very large number of wells, so that, barring marketing difficulties, the flow may be maintained for a long period of time. Also, during flush conditions in a new field, before the gasoline plant capacity has been built up to properly treat all of the gas, the outlet gas from the original plants may be comparatively rich.



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Under these conditions the operation of a stripper plant may be very profitable for a time.

Charcoal Stripper Plants

During the last two years several installations have been made of charcoal absorption plants for extracting gasoline from the outlet gas of the original oil absorption plants. In these plants the gasoline vapor is absorbed in beds of specially prepared cocoanut shell charcoal, and is then driven out with steam and condensed. This process has the advantage that it operates as well at low pressure as at high; hence it can be used by the wet gas plant operators themselves to strip the outlet gas from their plants.

Experience, however, has disclosed a number of serious difficulties in the operation of these plants. The absorptive power of the charcoal gradually declines until it has to be put through an expensive process of reactivation. The cost of the plant per gallon of production is much higher than the cost of an oil absorption plant, largely on account of the extremely high cost of the charcoal itself. On account of these objections local operators are tending to neglect the charcoal process and devote their attention rather to improving the efficiency of the oil absorption plants.

PACIFIC GASOLINE ANNUAL PICNIC BEST EVER

ON Saturday and Sunday, June 26 and 27, employees and families of the Pacific Gasoline Company to the number of more than 450 were entertained at the Sawmill Mountain Ranch of Harry J. Bauer, president of the company. This picnic occasion has become traditional with the company, and every employee looks forward to the annual excursion to the scenic mountain site in the Angeles National Forest, located 75 miles from Los Angeles in the neighborhood of Elizabeth Lake.

Competitive sports were prominent on the program, which also included a first aid contest between five teams, two from the northern division of the company, two from the southern division, and one from the general offices. First and second prizes of $50 and $30 respectively went to the two northern teams.

During the week-end 400 feet of movies were taken, and it is planned to exhibit the film to employees at a subsequent meeting.

Another high point of the program was the public speaking contest arranged for the employees who have been taking the course offered by the company in that activity. C. Elmo Fullmen was the winner of the handsome silver trophy offered by K. L. Reynolds, vice-president and general manager of the company.

The employees of the Pacific presented President Bauer with a bronze plaque appropriately worded with an expression of their appreciation of their chief executive in his daily role of "friend and comrade." The plaque is to be affixed to an old oak tree which has already seen more than a hundred summers; and the bronze tribute, employees were told by Mr. Bauer, will live out the rest of the tree's life with it.

Tests *on* Efficiencies *of* Absorption Towers

(Continued from Page 23)

meter. Each of the three operators distilled three samples from each gas in his own laboratory at 30 lbs. pressure. Comparison of results showed the following:

1. The yield from the iced condenser averaged 162.6% of the average of the 30 lb. 60°F. tests on gas "A" and 190.4% on gas "B." The average yield by operator B, using substantially the same apparatus as operator C differed by 11.0% on gas A and 18.9% on gas B.

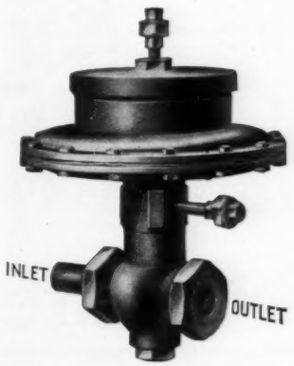
2. The average maximum variation between the highest and lowest test by each operator was 3.0% on gas A and 12.6% on gas B.

This clearly shows that the personal element has considerable effect. This has also probably been responsible for the lack of standardization in gas testing. An operator finding that he can check himself with a maximum variation of 3% (1.5% plus and minus) would be inclined to place confidence in his results although differing from other operators' results.

There are a great many places in the charcoal test where the personal element is introduced. There are six in the adsorption, six in the distillation and four in the weathering. In the adsorption: 1. Time of purging the meter. 2. Accuracy of meter. 3. Drying gas before or after metering. 4. Amount of charcoal and shape of tube. 5. Rate of adsorption. 6. Degree of saturation. (Where an orifice meter is used the determination of specific gravity is another factor.) In the distillation: 1. Design of still and condenser. 2. Distillation medium employed and amount. 3. Rate of heating. 4. Control of pressure. 5. Control of condenser temperature. 6. Reading volume of condensate. In weathering: 1. Temperature of the bath. 2. Method of venting—(either to atmosphere or through condenser tube). 3. Rate of venting to atmospheric pressure. 4. Time of venting before reaching 60°F.

V. CONCLUSIONS.

Quoting from the report of one of the companies participating: "The results of these comparative charcoal tests show conclusively that while the charcoal method of testing will give results which will check within 5% to 10% when conducted by the same operator, two operators can hardly be expected to check within 15% to 50%. Obviously such an inaccurate method of testing can not be employed to test the relative absorption efficiencies of towers whose



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operating efficiencies are of the same order as the percentage error, namely, 15% to 30%.

As to the sources of error in the distillation of the charcoal, the temperature control on the condenser affords the possibility of the greatest error. When the charcoal method was first investigated by this company in the summer of 1925, a number of tests were made on fairly uniform gases in which the effect of condenser temperature on the charcoal results were studied. The outlet of a certain plant tested 1.475 gal. M at 30 lb. when the condenser was kept at 60°F. but the same gas gave a result of 0.76 gal. M at 30 lb. when the condenser was held at 40°F. This is a difference of 0.014 gal. M per °F. difference in condenser temperature or 3% per °F. in the result. Similar tests on the outlet of another plant producing a 0.65 gal. M outlet gas, gave 2.3% difference per °F. in the results. At higher qualities of gas this variation due to condenser temperature falls off; for example, the inlet of this plant was 2.71 gal. per M at 30 lb. when the condenser was held at 60° F. and 3.11 gal. per M at 30 lb. when held at 40°F., a difference of 0.74% per °F.

In the charcoal distillation an operator generally controls the condenser temperature within 2° F. of 60° F. and reads the gasoline distillate to within 0.5 cc. It can be readily seen from the above discussion that if two operators control their tests on an outlet gas within the limits mentioned above that a 12% deviation may be expected from condenser temperature and a 3% deviation nay be expected from reading the volume of the gasoline distillate.

The matter of distillation discrepancies will be looked into further."

Another Company Testifies

In commenting upon the gas tests, another participating company says: "It is evident that the condensate obtained by these various means would differ in quality. However, in no instance was there obtained any measure of this quality. This is undoubtedly a vital factor in many tests and new equipment, designed to give some measure of the condensate quality, such as gravity and vapor would prove very helpful."

In regard to the distillation of oil the same report continues: "It might be desirable to design a still which could be used to procure the necessary oil sample under its existing pressure and then distill the sample under pressure eliminating the undesirable features of pressure release, agitation, increase in temperature, etc., afforded by the act of transferring the sample from sample container to still."

"From the mass of data obtained it is quite evident that there is great need of more efficiently designed equipment, better methods of sampling and better methods of testing before it is possible to obtain a true idea of the relative performance and efficiency of absorbers and other equipment."

Glycerine Introduces Error

This Laboratory concurs in the conclusions reached above. We also believe the distillation with glycerine introduces another error whose effect is large and again dependent upon the personal element.

Glycerine, as is well known, undergoes considerable decomposition at the higher temperatures. This decomposition begins, however, at a rather low temperature and one or more of the products are very soluble in gasoline, imparting to the gasoline a color. This material has a distinct acid reaction. In a preliminary test 20 cc of stable gasoline (b.p. 150-220°F.) were added to new charcoal and C. P. glycerine and were distilled over until a vapor temperature of 500°F. was reached. The gasoline fraction measured 23.5 cc, an increase of 17.5% and the gravity dropped 17.1° A.P.I.

Glycerine which had been distilled over in the usual manner when extracted with an equal volume of gasoline yielded 7% by volume to the gasoline. A 30 cc sample of gasoline which had been distilled over at the same time when treated with a KOH solution lost 6⅔% by volume and gave a brown substance insoluble in both gasoline and the KOH solution which floated between the two liquids. The pressure distillation with glycerine also produces large volumes of gases which leave the condenser saturated with gasoline introducing additional losses. Some of these gases dissolve in the gasoline and cause the gasoline to boil more violently during venting. These dissolved gases would complicate the measurement of vapor pressure of the charcoal product.

In consideration of these difficulties and the lack of standardization, we recommend that further tests of absorbers be deferred until the errors and differences in testing methods can be reduced below the differences in absorber efficiencies.

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Early in June the Newton Process Manufacturing Company of Fullerton, Calif., announced an arrangement completed with the National Supply Company of Toledo, Ohio, whereby the latter will market and service Newton Process gasoline absorption equipment through its chain of more than 100 stores.

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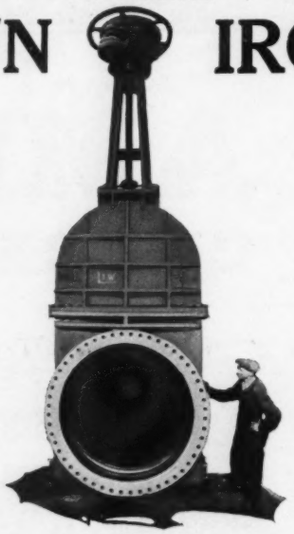

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Variable Speed Motors

(Continued from Page 19)

for one hour on constant speed to suit volume and pressure conditions, with two oil gas generators in operation. Under this operation, 45 kilowatt hours were consumed and the operating conditions were the same as in the first test.

The difference between the two tests is 10 kilowatt hours in favor of variable speed and for a year's operation would be 87,600 kilowatt hours. Figuring this on an average rate for energy would show a saving of $1,165.00 per year. The additional cost for a variable speed induction motor would be paid for in less than five months.

The third test was run for one hour on constant speed to suit volume and pressure conditions, with one oil gas generator in operation. Under this operation, 40 kilowatt hours were consumed.

The fourth test was run for one hour on variable speed to suit volume and pressure conditions, with one oil gas generator in operation. Under this operation, only 20 kilowatt hours were consumed. The operating conditions were the same as in the third test.

The difference in kilowatt hours for the operation of one oil gas generator is also in favor of variable speed motors amounting to 20 kilowatt hours. Figuring this on an average rate for energy would show a saving of $2,230.00 per year. The additional cost of a variable speed motor would be paid for in less than two and one-half months.

The off-position of the controller in the fourth test showed 885 revolutions per minute and was pulling four amperes. When idling, it is unnecessary to run at this speed, and we are now planning to add additional external resistance to lower this speed to 400 revolutions per minute. This will reduce the energy consumed per run.

There were no test runs made on the low pressure gas boosters or the gas exhauster, but it is evident from these tests that they would also show a large power saving, as there is no doubt that variable speed induction motors are ideal for this class of service.

Radiant Heat

(Continued from Page 30)

blowing, and (2) when the sun is obscured, but the air is still and hot, the thermometer temperature being the same. The former conditions give rise to a pleasant feeling of exhilaration and comfort, the latter to lassitude and heaviness. For a room to be comfortable, therefore, *the air must be kept cool.*

A room heated by radiant heat eliminates cold feet, hot heads, thirst and headaches. Instead of creating a general feeling of lassitude the air is very invigorating.

Your radiant heater to give perfect results should be cleaned at least once a year. To do this remove the radiants and clean out any dirt or dust that has lodged in the burner tips. Blow through the burner tips to remove possible dirt in burner tube. Blow dust from radiants. When a radiant heater is properly adjusted the lower two-thirds of the elements should be quite incandescent, the top third should just show a pink glow. Should the elements become completely incandescent an excessive amount of gas is being burned, and complete combustion is not achieved.

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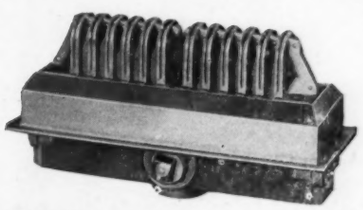

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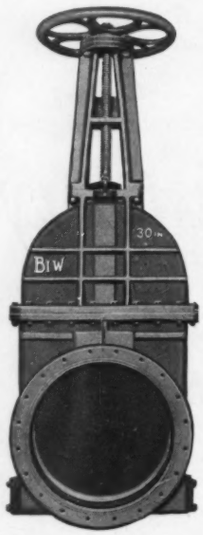

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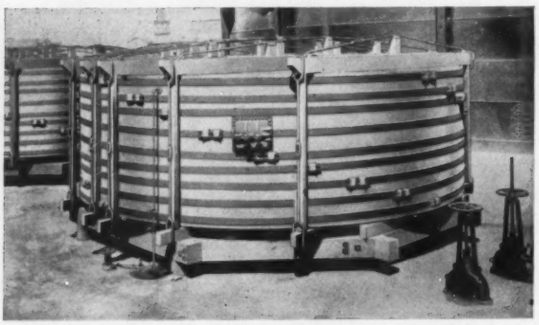

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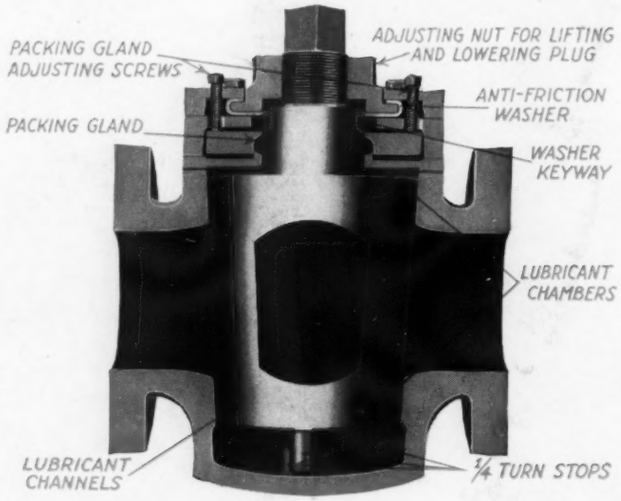

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